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Vol. 1050 Number 3

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of the UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

January 15, 1985

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 15, 1985 Volume 1050 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	64.00
Designation fee for 11th and subsequent designations	no charge

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Dec. 24, 1984.

Patent Cooperation Treaty (PCT) Update

Change in International Fees effective Jan. 1, 1985, change in international search fee charged by European Patent Office, and Listing of PCT Countries

I. Change in International Fees, Effective Jan. 1, 1985

On Sept. 28, 1984, the PCT Assembly in its twelfth session (eighth Extraordinary) held in Geneva, Switzerland, fixed new amounts for the various international fees set in Swiss francs in the Schedule of Fees annexed to the PCT Regulations, effective Jan. 1, 1985. The new amounts in Swiss francs reflect a 5% increase over the previous amounts. The U.S. dollar amounts, however, reflect an overall decrease from the previous amounts.

The PCT Assembly also fixed an upper limit on the number of designation fees which must be paid for a single PCT application at ten. Effective Jan. 1, 1985 designation fees must be paid only for the first ten (10) country or regional designations. There is no payment due for the eleventh and subsequent country or regional designations.

Effective Jan. 1, 1985, for the United States applicants filing PCT international applications in the United States Receiving Office, the amount of the International fees are as follows:

Basic Fee (first 30 pages)	$ 265.00
Basic Supplemental Fee (each page over 30)	5.00
Designation Fee (per country or region up to ten)	64.00
Designation Fee (for 11th and subsequent countries or regions)	No Charge

II. Change in international search fee charged by European Patent Office

A new amount of 690 U.S. dollars has been established for the search fee for an international search by the European Patent Office. The new amount is applicable as from Jan. 3, 1985.

III. Listing of PCT Member Countries

Listing of PCT Member Countries

	Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1)	Central African Republic*	Accession	15 September 1971	01 June 1978
(2)	Senegal*	Ratification	08 March 1972	01 June 1978
(3)	Madagascar	Ratification	27 March 1972	01 June 1978
(4)	Malawi	Accession	16 May 1972	01 June 1978
(5)	Cameroon*	Accession	15 March 1973	01 June 1978
(6)	Chad*	Accession	12 February 1974	01 June 1978
(7)	Togo*	Ratification	28 January 1975	01 June 1978
(8)	Gabon*	Accession	06 March 1975	01 June 1978
(9)	United States of America	Ratification	26 November 1975	01 June 1978
(10)	Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)	Congo*	Accession	08 August 1977	01 June 1978
(12)	Switzerland**	Ratification	14 September 1977	01 June 1978
(13)	United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)	France**	Ratification	25 November 1977	01 June 1978
(15)	Soviet Union	Ratification	29 December 1977	01 June 1978
(16)	Brazil	Ratification	09 January 1978	01 June 1978
(17)	Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)	Sweden**	Ratification	17 February 1978	01 June 1978
(19)	Japan	Ratification	01 July 1978	01 October 1978
(20)	Denmark	Ratification	01 September 1978	01 December 1978
(21)	Austria**	Ratification	23 January 1979	23 April 1979
(22)	Monaco	Ratification	22 March 1979	22 June 1979
(23)	Netherlands**	Ratification	10 April 1979	10 July 1979
(24)	Romania	Accession	23 April 1979	23 July 1979
(25)	Norway	Ratification	01 October 1979	01 January 1980
(26)	Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)	Australia	Accession	31 December 1979	31 March 1980
(28)	Hungary	Ratification	27 March 1980	27 June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)	Finland	Ratification	01 July 1980	01 October 1980
(31)	Belgium**	Ratification	14 September 1981	14 December 1981
(32)	Sri Lanka	Accession	26 November 1981	26 February 1982
(33)	Mauritania*	Accession	13 January 1983	13 April 1983
(34)	Sudan	Accession	16 January 1984	16 April 1984
(35)	Bulgaria	Accession	21 February 1984	21 May 1984
(36)	Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)	Mali*	Accession	19 July 1984	19 October 1984

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member countries. A designation of any country is an indication that all OAPI countries have been designated. Note: Only one designation fee is due regardless of the number of OAPI member countries designated.

** Member of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member countries are available through PCT, except for France and Belgium, for which only European patents are available if PCT used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

Dec. 24, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 12, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,309,774 through 4,310,924

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,323,979, Re. S.N. 423,768, Filed Sept. 27, 1982, Cl. 162/167, METHOD OF IMPROVING THE DRAINAGE RATE IN FORMING PAPER BY INCORPORATING A REACTION PRODUCT OF POLYACRYLAMIDE, FORMALDEHYDE AND DIALKYLAMINE IN THE FURNISH, William A. Foster, Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 173

4,334,674, Re. S.N. 525,775, Filed Feb. 21, 1984, Cl. 271/4 5, AUTOMATIC FEEDING DEVICE FOR COPYING MACHINES, Shoichi Ishii, Owner of Record: *Fuji Xerox Co., Ltd., Tokyo, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 312

4,338,776, Re. S.N. 629,268, Filed July 10, 1984, Cl. 57/246, PROCESS FOR THE PRODUCTION OF A CRIMPED CONTINUOUS MULTIFILAMENT YARN, Eberhard Krenzer, Owner of Record: *Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Federal Republic of Germany,* Attorney or Agent: Charles B. Park, III, et al., Ex. Gp.: 245

4,348,550, Re. S.N. 648,691, Filed Sept. 7, 1984, Cl. 179/90B, SPOKEN WORD CONTROLLED AUTOMATIC DIALER, Frank C. Pirz, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, Ex. Gp.: 261

4,358,883, Re. S.N. 672,353, Filed Nov. 16, 1984, Cl. 029/401.1, VEHICLE TOP STRUCTURE AND METHOD OF ASSEMBLY, Harold E. Gerring, Owner of Record: *Gerwin Vans, Inc., Bristol, Ind.,* Attorney or Agent: Thomas P. Jenkins, et al., Ex. Gp.: 326

4,359,340, Re. S.N. 672,240, Filed Nov. 15, 1984, Cl. 106/38.22, TIRE CURING BLADDER LUBRICANT, Louis F. Comper (Deceased), et al., Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Richard H. Childress, Ex. Gp.: 157

4,359,432, Re. S.N. 671,973, Filed Nov. 16, 1984, Cl. 261/026, POST-MIX BEVERAGE DISPENSING SYSTEM SYRUP PACKAGE, VALVING SYSTEM, AND CARBONATOR THEREFOR, Jason K. Sedam, et al., Owner of Record: *The Coca-Cola Co., Atlanta, Ga.,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 135

4,377,069, Re. S.N. 653,525, Filed Sept. 24, 1984, Cl. 060/547.1, BRAKE BOOSTER, Hideyuki Kobayashi, Owner of Record: *Aisin Seiki Kabushiki Kaisha, Aichi-Ken, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 341

4,430,646, Re. S.N. 672,462, Filed Nov. 19, 1984, Cl. 340/630, FORWARD SCATTER SMOKE DETECTOR, Robert B. Enemark, Owner of Record: *American District Telegraph Co., Jersey City, N.J.,* Attorney or Agent: James H. Grover, Ex. Gp.: 268

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

National Inventors Expo

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc., will sponsor the Thirteenth Annual National Inventors Expo in the Public Search Room on Saturday, Feb. 9, 1985 from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 10, 1985 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 10 at 2:00 p.m.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 8, 1985 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF
Dec. 18, 1984. *Commissioner of Patents and Trademarks.*

Names of Registered Attorneys and Agents Reinstated on the Active Register

In the May 8, 1984 issue of the Official Gazette, there was published a list of names and addresses of persons whose names had been removed from the Registers of Patent Attorneys and Agents pursuant to the provisions of 37 CFR §1.347.

The following persons, whose names appeared in that list have been reinstated on the active Register of Attorneys or Register of Agents, in view of information which they have furnished to the Office of Enrollment and Discipline.

WILLIAM FELDMAN,
Dec. 18, 1984. *Director, Office of Enrollment and Discipline.*

Papageorge, Chris, Herzig, Schaap & Yanny, 9465 Wilshire Blvd., Suite 428, Beverley Hills, Calif. 90212.

Parad, Boris, International Harvester, 401 N. Michigan Ave., Suite 2300, Chicago, Ill. 60611

Parker, Albert M., American Flange & Mfg. Co., Inc., 1100 W. Blancke St., P.O. Box 167, Linden, N.J. 07036

Patterson, James H., Dorsey & Whitney, 2200 First Bank Place E., Minneapolis, Minn. 55402

Peacock, Frank A., Jones & Askew, P.O. Box 56326, Atlanta, Ga. 30343

Pellicano, Anthony, Morgan, Finnegan, Pine, Foley & Lee, 345 Park Ave., New York, N.Y. 10154

Peoples, Veo, Jr., Anheuser-Busch Co., Inc., One Busch Pl., St. Louis, Mo. 63118

Peters, Howard M., Burns, Doane, Swecker & Mathis, 233 Sansome St., Suite 1004, San Francisco, Calif. 94104

Pettis, David W., Jr., Duckworth, Allen, Dyer & Pettis, P.A., P.O. Box 1528, Tampa, Fla. 33601

Pitcher, David M., Staas & Halsey, 1825 K St., N.W., Suite 816, Washington, D.C. 20006

Plum, Leo A., Jr., Union Carbide Corp., Old Ridgebury Rd., Danbury, Conn. 06817

Pollock, Michael J., National Semiconductor Corp., 2900 Semiconductor Dr., Santa Clara, Calif. 95051

Polson, Allen E., 6 Broadview Dr., Barrington, R.I. 02806

Porter, George J., 2007 Gallatin St., Suite C, Huntsville, Ala. 35801

Price, Bradford R. L., Baxter Travenol Labs., Inc., One Baxter Pkwy., Deerfield, Ill. 60015

Puffer, Jack D., Boeing Vertol Co., P.O. Box 16858, Philadelphia, Pa. 19142

Quarton, Charles E., N.A.P. Consumer Electronics Corp., Interstate 40 & Straw Plains Pk., Knoxville, Tenn. 37914

Rajender, Shyamala, Lawrence Livermore National Lab., L-376, Box 808, Livermore, Calif. 94550

Ratner, Allan, Ratner & Prestia, 412 Leighton Bldg., Valley Forge, Pa. 19482

Reck, James R., Locite Corp., 705 N. Mountain Rd., Newington, Conn. 06111

Rich, James A., Alcan Aluminum Corp., 100 Erieview Plz., Cleveland, Ohio 44114

Rines, Robert H., Rines & Rines, 81 N. State St., Concord, N.H. 03301

Riteris, Andrew O., Michael, Best & Friedrich, 250 E. Wisconsin Ave., Milwaukee, Wis. 53202

Roberts, Kent B., Merchant, Gould, Smith, Edell, Welter & Schmidt, Suite 100 Northwestern National Bk. Bldg., St. Paul, Minn. 55101

Robertson, Frederick A., 704 Wimbledon La., Livermore, Calif. 94550

Robillard, George N., Finnegan, Henderson, Farabow, Garrett, & Dunner, 1775 K St., Suite 600, Washington, D.C. 20006

Rodgers, Walter M. Jr., 1114 Gas Light Tower, Peachtree Center, Atlanta, Ga. 30303

Rogers, L. Lawton III, 727 23rd St. S., Suite 218, Arlington, Va. 22202

Rohm, Benita Jill, 512 Springfield Ave., Cranford, N.J. 07016

Romney, Rita Maria, Eckert, Seamans, Cherin & Mellott, 600 Grant St., Pittsburgh, Pa. 15219

Ross, Edmund C., Jr., Hercules, Inc., Hercules Plz., Wilmington, Del. 19894

Rowe, Donald A., 7255 Marblehead Dr., Hudson, Ohio 44236

Ryan, Daniel D. III, Baxter Travenol Labs., Inc., One Baxter Pkwy., DF2-2E, Deerfield, Ill. 60015

PATENT NOTICES

Certificates of Correction for the Week of Jan. 15, 1985

Re. 31,495	4,425,428	4,451,950	4,459,312
Re. 31,595	4,426,785	4,452,144	4,459,642
4,301,191	4,428,939	4,452,407	4,460,044
4,334,162	4,429,971	4,452,818	4,460,622
4,369,182	4,433,776	4,453,100	4,460,761
4,377,633	4,433,852	4,453,217	4,460,916
4,391,937	4,434,581	4,453,546	4,461,007
4,395,001	4,435,916	4,454,026	4,461,951
4,397,941	4,437,951	4,454,270	4,461,995
4,407,510	4,440,856	4,454,365	4,462,086
4,408,083	4,442,498	4,454,683	4,462,244
4,408,202	4,443,795	4,454,760	4,462,289
4,413,180	4,445,036	4,455,525	4,462,476
4,414,629	4,445,224	4,455,534	4,463,667
4,419,550	4,445,395	4,455,642	4,464,216
4,420,381	4,445,735	4,455,754	4,464,225
4,421,747	4,446,217	4,456,571	4,465,076
4,422,803	4,446,254	4,457,664	4,466,223
4,423,183	4,446,726	4,458,487	4,466,225
4,423,194	4,447,813	4,458,629	4,466,933
4,423,882	4,448,421	4,458,689	4,467,119
4,425,165	4,450,148	4,459,067	4,472,475
4,425,270	4,450,239	4,459,100	4,472,841

Disclaimers

Des. No. 253,752.—*Robert E. Dilgard, Jr.*, Cincinnati, Ohio. RADAR WARNING RECEIVER. Patent dated Dec. 25, 1979. Disclaimer filed Oct. 28, 1984, by the assignee, *Cincinnati Microwave, Inc.*

Hereby enters this disclaimer to the entire remaining term of said patent.

3,483,221.—*Max Wilhelm*, Allschwil, Switzerland, *Hans Ulrich Daeniker*, Clifton, N.J., and *Karl Schenjer*, Binningen and *Paul Schmidt*, Therwil, Switzerland. 1-(ISOPROPYLAMINO)-2-HYDROXY-3-(ALKENYLOXYPHENOXY)-PROPANES AND THE SALTS THEREOF. Patent dated Dec. 9, 1969. Disclaimer filed Oct. 22, 1984, by the assignee, *Ciba-Geigy Corp.*

Hereby enters this disclaimer to claims 1, 3, 6 and 7 of said patent.

4,464,155.—*Peter C. Collura*, Los Altos, *Boyd D. Goda*, Santa Clara, and *Harvey N. Palagi*, San Carlos, Calif. APPARATUS AND METHOD FOR FORMING AND DEBOWING CARTONS. Patent dated Aug. 7, 1984. Disclaimer filed Oct. 23, 1984, by the assignee, *Kliklok Corp.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 15 and 16 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: University of Massachusetts Library	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-20-81
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-25-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-14-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	12-06-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-02-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-08-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	2-16-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-24-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-12-80
DESIGN, GROUP 290—K. L. CAGE, Director	9-20-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	7-23-81
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-16-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-27-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-05-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	12-04-81

Expiration of patents: The patents within the range of numbers indicated below expire during December 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,355,744 to 3,360,799, inclusive

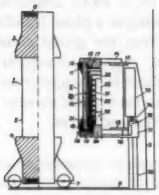
Plant Patents . . . . . Numbers 2,781 to 2,783 inclusive

REEXAMINATIONS

JANUARY 15, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,732,068 (296th)
CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE AND UNDER HIGH PRESSURE
Hans Larker, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Västerås, Sweden
Reexamination Request No. 90/000,382, May 16, 1983.
Reexamination Certificate for Patent No. 3,732,068, issued May 8, 1973, Ser. No. 158,742, Jul. 1, 1971.
Claims priority, application Sweden, Jul. 10, 1970, 9594/70
Int. Cl.[3] F27B *3/02*
U.S. Cl. 432—120



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

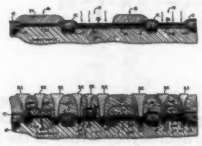
Claim 4 is cancelled.

Claims 1-3, 5, and 6 are determined to be patentable as amended.

Claims 7-9, dependent on an amended claim, are determined to be patentable.

1. Vertical furnace, preferably for hot isostatic compaction of powder bodies, comprising a stand, a cylindrical pressure chamber suspended in the stand and comprising a high pressure cylinder and top and bottom end closures projecting into the pressure chamber, means forming a furnace chamber within the pressure cylinder and insulation arranged between the furnace chamber and the walls of the pressure chamber comprising an insulating part in the shape of a sealed lid which is formed of at least two separate parts each comprising a transverse portion and a cylindrical wall extending downwardly from the periphery of said transverse portion, said parts being closed in a gas-tight manner at the top and with insulation *material* filling the space between the transverse portions *and the space between said cylindrical walls, an annular part resting on said lower end closure, a heating element disposed within the insulating part, said at least two separate parts and said heating element at the lower ends thereof being secured to said annular part.*

B1 4,052,229 (297th)
PROCESS FOR PREPARING A SUBSTRATE FOR MOS DEVICES OF DIFFERENT THRESHOLDS
Richard D. Pashley, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Reexamination Request No. 90/000,036, Jul. 28, 1981.
Reexamination Certificate for Patent No. 4,052,229, issued Oct. 4, 1977, Ser. No. 700,043, Jun. 25, 1976.
Int. Cl.[3] H01L *21/265, 29/78*
U.S. Cl. 148—1.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-13 are cancelled.

[1. In the fabrication of MOS devices, a process for preparing a silicon substrate comprising the steps of:

a. forming a first masking means over a first area of said substrate;

b. subjecting said substrate to a first dopant such that portions thereof other than said first area of said substrate are doped with said first dopant;

c. forming a second masking means over a second area of said substrate, said second area being coextensive with a portion of said first area;

d. subjecting said substrate to a second dopant such that portions thereof other than said second area of said substrate are doped with said second dopant;

said steps (a) through (d) resulting in four host regions in said substrate each having a different doping level such that when a field-effect transistor is formed in each of said host regions each such transistor may have a different threshold voltage;

fabricating MOS devices in said host regions, each having a different threshold voltage.]

B1 4,272,435 (298th)
PROCESS FOR THE PREPARATION OF AZO COMPOUNDS FROM AMINO COMPOUNDS IN THE PRESENCE OF A PHASE TRANSFER CATALYST
Teruo Matsuda; Shigeo Wake, both of Niihama, and Tetsuya Shiozaki, Saijo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Reexamination Request No. 90/000,337, Mar. 7, 1983.
Reexamination Certificate for Patent No. 4,272,435, issued Jun. 9, 1981, Ser. No. 945,504, Sep. 25, 1978.
Claims priority, application Japan, Oct. 12, 1977, 52-122725; Dec. 19, 1977, 52-153363; Apr. 18, 1978, 53-46351
Int. Cl.[3] C07C *107/00, 107/02, 107/04*
U.S. Cl. 260—192

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

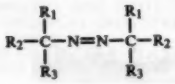
The patentability of claim 17 is confirmed.

Claims 1, 6, and 7 are determined to be patentable as amended.

Claims 2-5, 8-16 and 18, dependent on an amended claim, are determined to be patentable.

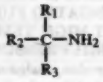
New claims 19 and 20 are added and determined to be patentable.

1. A process for producing an azo compound of the formula (I),



(I)

wherein each of R_1 and R_2 is selected from the group consisting of (1) C_1–C_8 aliphatic hydrocarbon unsubstituted or substituted with carboxyl, hydroxyl or alkoxy of the formula —OR_4 in which R_4 is C_1–C_4 aliphatic hydrocarbon, (2) C_3–C_8 alicyclic hydrocarbon, (3) C_6–C_{10} aromatic hydrocarbon and (4) C_4–C_{12} alicyclic hydrocarbon formed by combining R_1 and R_2 together with the adjacent carbon atom, and R_3 is selected from the group consisting of nitrile, ester of the formula —$COOR_4$ in which R_4 is C_1–C_4 aliphatic hydrocarbon, carboxylate of the formula —COOM in which M is an alkali metal or alkaline earth metal, and carboxyamido, by reacting an amino compound of the formula (II), having an ammonia content of 2.0% by weight or less,



(II)

wherein R_1, R_2 and R_3 are as defined above, with a metal *hypohalite* [hypohalide] of the formula (III),

$$M(OX)_n \quad \text{(III)}$$

wherein M is an alkali metal or alkaline earth metal, X is chlorine, bromine or iodine and n is the valence of the metal M, or with an alkyl hypohalite of the formula (IV),

$$R_5OX \quad \text{(IV)}$$

wherein R_5 is C_1–C_6 aliphatic hydrocarbon and X is as defined above, in the presence of an alkali, characterized in that said reaction is carried out using as a phase transfer catalyst at least one member selected from the group consisting of organic quaternary ammoniums, organic quaternary phosphoniums and macrocyclic polyethers in a heterogeneous medium comprising water and at least one organic solvent selected from the group consisting of nitriles and esters.

REISSUES

JANUARY 15, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

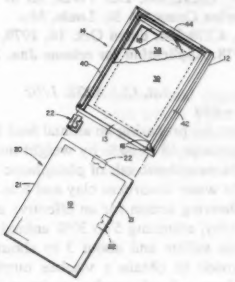
Re. 31,799
FRAME HANGER

Wayne H. Paskerian, West Somerville, Mass., assignor to M. W. Carr & Co., Inc., West Somerville, Mass.

Original No. 3,965,600, dated Jun. 29, 1976, Ser. No. 554,400, Mar. 3, 1975. Application for reissue Feb. 13, 1984, Ser. No. 579,256

Int. Cl.³ G09F *1/12*

U.S. Cl. 40—152.1 10 Claims



1. A picture frame assembly comprising:

a frame element having inwardly facing, opposed, recesses in opposite sides thereof in a common plane;

a rigid back plate having front and rear faces with its side edges and one edge receivable within said recesses; and

an integral hanging clip having:

a U-shaped retaining portion positioned between one of said recesses and one of said edges and retained thereby for sliding movement therealong; [and]

an offset hanging portion extending inwardly from said frame element and being outwardly spaced from the exterior face of said back plate for receiving an external hanging device between said clip and said back plate to support said frame assembly from a wall or the like; *and,*

a spacing portion intermediate and connected to said retaining portion and said offset hanging portion and extending generally transversely of said clip.

Re. 31,800
PROBE

Friedrich G. Lauterjung, Schallstrasse 6, 5000 Cologne 41, Fed. Rep. of Germany

Original No. 4,236,521, dated Dec. 2, 1980, Ser. No. 902,373, May 3, 1978. Application for reissue Sep. 30, 1982, Ser. No. 430,555

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721548

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—270 33 Claims

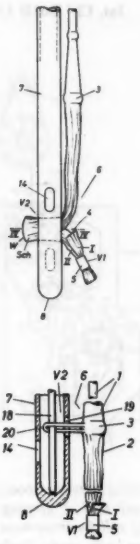
20. A probe means, particularly for enteral feeding of living creatures extending from the outside in an inserted condition at a target site in the creatures, comprising

a probe tube having an insertion end range,

said insertion end range of said probe tube includes a balloon communicatingly connected to said probe tube, said balloon being adapted to be filled with liquid through said probe tube,

a pilot probe extending adjacent to said probe tube,

means operatively engaging said probe tube at said insertion end range by said pilot probe for initially inserting said probe tube and said balloon respectively into the creature and removably disengaging said pilot probe from said probe tube and from the creature from the outside, and



means for emptying said balloon in an inserted condition in the creature at the target site.

Re. 31,801
UREA-FORMALDEHYDE SOLUTION FOR FOLIAR FERTILIZATION

William P. Moore, Jr., Hopewell, Va., assignor to Hawkeye Chemical Company, Clinton, Iowa

Original No. 4,244,727, dated Jan. 13, 1981, Ser. No. 10,115, Feb. 7, 1979. Application for reissue Nov. 15, 1982, Ser. No. 441,953

Int. Cl.³ C05B *15/00*

U.S. Cl. 71—29 16 Claims

13. A clear, storage-stable, aqueous plant food solution comprising partially reacted urea and formaldehyde primarily as methylol ureas and with a ratio of between 1.5 and 2.0 mols urea per mol of formaldehyde, said solution having a nitrogen content not less than 10% and not appreciably more than 30% by weight and having a viscosity between 10 and 60 centipoise at 25° C., said solution being buffered to a pH between 7.5 and 9.8 by one or more buffering agents having a buffer capacity controlled so that between about 0.05 and 0.30 milliequivalents of phosphoric acid are required to decrease the pH of one gram of the solution to 7, and said solution being sufficiently reactive to allow further urea-formaldehyde reaction to form effective amounts of slow-releasing water-insoluble plant food nitrogen, without requiring addition of any materials, when the solution is applied to the foliage of plants or to soil having a pH ranging from about 5.0 to 7.5.

Re. 31,802

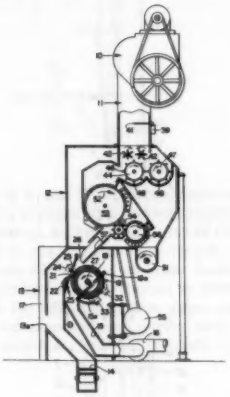
ROLLER GIN AND FEED SYSTEM INCORPORATING THE SAME

Robert R. Eiglett, Cataula; John M. Conner, Columbus; William A. Harmon, Columbus; James B. Hawkins, Columbus; William C. Pease, III, Columbus, and Donald W. Van Doorn, Columbus, all of Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Original No. 4,262,390, dated Apr. 21, 1981, Ser. No. 40,689, May 21, 1979. Application for reissue Feb. 23, 1983, Ser. No. 468,988

Int. Cl.³ D01B *1/06*

U.S. Cl. 19—50 13 Claims



12. In a cotton ginning system embodying at least one roller gin having a ginning roll and a ginning knife with means for mounting the ginning roll for movement into and out of ginning relation to the ginning knife, and a feeder having a pair of driven feed rolls disposed to feed seed cotton to the gin, the improvement comprising:

(a) means responsive to the absence of a predetermined minimum amount of seed cotton at the inlet of the feeder to produce a signal,

(b) means to stop the rotation of the feed rollers upon receiving the signal from the means of element (a), above, and

(c) means effective after the passage of a predetermined time to move the ginning roll away from the ginning knife in response to said signal.

Re. 31,803

METHOD FOR CATHODIC ELECTRODEPOSITION OF COATING COMPOSITIONS CONTAINING DIELS-ALDER ADDUCTS

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Wyandotte Paint Products Company, Troy, Mich.

Original No. 4,148,704, dated Apr. 10, 1979, Ser. No. 859,296, Dec. 12, 1977. Application for reissue Apr. 9, 1981, Ser. No. 252,666

Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 C 11 Claims

1. A method of electrocoating a film forming substance onto a substrate by employing an anode, a cathode and an electrolyte therebetween comprising the steps:

(1) Providing an aqueous electrolyte containing an organic coating composition comprising a dispersion, solution or suspension of a coating composition characterized by:

(a) the reaction product of a conjugated fatty acid ester and an acrylic containing monomer; and

(b) Formula A within the molecule and being the reaction product of reacting an amine with an oxirane ring; wherein Formula A is:

$-CH_2-C(Z)-CH_2-N=$

wherein Z is independently selected from the group consisting of hydrogen, hydroxyl, alkoxy of from one to 6 carbon atoms; acyloxy of from one to 6 carbon atoms; (=O),$-[OR']_nH$, $-[OR']_nOH$, and $-[OR'(CH_2OH)]_nOH$; wherein R' is a saturated alkylene of from 2 to 4 carbon atoms and n is a number from 1 to 6;

(2) Closing the circuit between the anode and the cathode; and

(3) Depositing the film forming composition onto the cathodic substrate.

Re. 31,804

ANIMAL FEED BLOCK CONTAINING FERROUS SULFATE AND MAGNESIUM OXIDE

Leroy V. Skoch, Glencoe; Bud G. Harmon, Kirkwood, and Charles W. Dickerson, Des Peres, all of Mo., assignors to Ralson Purina Company, St. Louis, Mo.

Original No. 4,171,386, dated Oct. 16, 1979, Ser. No. 893,736, Apr. 5, 1978. Application for reissue Jan. 26, 1984, Ser. No. 573,981

Int. Cl.³ A23K *1/02*

U.S. Cl. 426—658 10 Claims

1. A process for preparing an animal feed block which comprises mixing about 18 to 65% by weight molasses, about 4 to 9% by weight monobasic salt of phosphoric acid, about 0.5 to 5% by weight water absorbent clay and 5 to 20% water under high speed shearing action for an effective amount of time to disperse the clay, admixing 5 to 30% animal fat, about 8% by weight ferrous sulfate and about 3 to about 15% by weight magnesium oxide to obtain a viscous nutrient mixture that solidifies to form a hard weather resistant block within one hour at room temperature, said block having a water activity of from 0.8 to 0.9.

Re. 31,805

METHOD FOR MAKING POLYIMIDES

Tohru Takekoshi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Original No. 4,324,882, dated Apr. 13, 1982, Ser. No. 188,755, Sep. 19, 1980. Application for reissue Jan. 16, 1984, Ser. No. 571,323

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—206 13 Claims

1. A method for making polyimides which comprises

(1) effecting reaction between a $C_{(6-30)}$ aromatic organic dianhydride and a $C_{(2-20)}$ organic diamine in the presence of an effective amount of an alkali metal salt of an oxygenated phosphorus compound, selected from the group consisting of orthophosphates, dihydrogen orthophosphates, hypophosphates, pyrophosphates, metaphosphates, orthophosphites, [and] arylphosphonates and *arylphosphinates, and*

(2) recovering the resulting polyetherimide from the mixture of (1).

Re. 31,806

MONOLITHIC MULTI-EMITTING LASER DEVICE

Donald R. Scifres, Los Altos; William Streifer, and Robert D. Brunham, both of Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

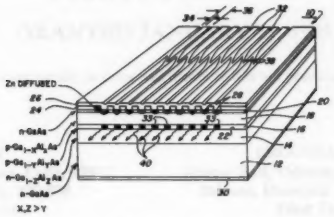
Original No. 4,255,717, dated Mar. 10, 1981, Ser. No. 956,307, Oct. 30, 1978. Application for reissue Mar. 8, 1983, Ser. No. 473,304

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—50 57 Claims

1. In a monolithic laser device wherein one or more layers of semiconductor material are fabricated on a substrate, one of said layers forming [an] active [layer] *means* for light wave propagation and generation under lasing conditions, means for forward biasing said active [layer] *means* to produce a plurality of adjacent , *linear* light propagating and emitting portions

therein, light guiding regions in said device *intermediate of the ends of and* nonlinear relative to said emitting portions whereby [said] *the* light waves produced in one portion of said active [layer] *means* are deflected and coupled into one or more adjacent emitting portions of said active [layer]



means , said regions provided by a refractive index change with which [said] *the* light wave interacts while [said light wave is] within said regions and wherein said refractive index change is provided by the injected charge distribution determined by current confining means.

PLANT PATENTS

GRANTED JANUARY 15, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,388

PEACH PLANT

Raymond Goosen, 5327 Ave. 400, Dinuba, Calif. 93618

Filed Jul. 1, 1983, Ser. No. 509,878

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach substantially as described and illustrated, which is characterized by a vigorous, regular bearing tree hardy for California conditions, very early ripening fruit with blush to dark red mottling and longitudinal red streaking over yellow ground color, large size for its early season, semi-free stone, and globose form, and which most closely resembles its parent plant, Springcrest (unpatented) and Maycrest (U.S. Plant Pat. No. 4,064), also an early maturing sport of Springcrest, but is distinguished therefrom by reaching commercial maturity 7 days earlier than Springcrest and 3 days earlier than Maycrest.

5,389

AZALEA NAMED NANCY MARIE

Richard A. Arnesen, Sylmar, Calif., assignor to Geo. J. Ball Inc., West Chicago, Ill.

Filed Jun. 16, 1983, Ser. No. 504,961

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. The new and distinct variety of azalea plant, substantially as herein shown and described, characterized by its basically white flower petals each having a longitudinal midsection of pink coloration which presents a star-like appearance for the fully opened flower.

5,390

BEGONIA PLANT NAMED PIA ELISE

Holger Boll, Odense, Denmark, assignor to L. Daehnfeldt Ltd., Odense, Denmark

Filed Jun. 20, 1983, Ser. No. 506,212

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Pia Elise, as illustrated and described, comprising a flower color mutation of the cultivar Barbara, and particularly characterized by its large double, deep pink flowers which do not significantly fade under abnormal conditions, with the flower color pleasantly contrasting with dark green foliage; vigorous growth habit, and by its ease of manipulation for year around flower production, especially for larger containers and hanging baskets for interior decorating.

5,391

BEGONIA PLANT NAMED ELLEN

Erland V. Schelbeck, Odense, Denmark, assignor to L. Daehnfeldt Ltd., Odense, Denmark

Filed Jun. 20, 1983, Ser. No. 506,213

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Ellen, as described and illustrated, and particularly characterized by its large flower size and compound inflorescence, brilliant and uniform red flower color, fast propagation, rapid flowering, and its foliage which is infused with maroon in margins and underside.

PATENTS

GRANTED JAN. 15, 1985

ERRATA

For CLASS	See PATENT NO.
474–014	4,493,221
384–533	4,493,513
384–613	4,493,514
534–697	4,493,798
333–028	4,494,082
333–033	4,494,083
333–081	4,494,084

PATENTS

GRANTED JANUARY 15, 1985

GENERAL AND MECHANICAL

4,493,115

FIREARM RECOIL PROTECTION SYSTEM

Bruce R. Maier, and Lincoln R. Flannery, both of Columbia, Mo., assignors to P.A.S.T. Corporation, Columbia, Mo.

Filed Jun. 4, 1982, Ser. No. 384,922
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **16 Claims**

1. In a firearm recoil protection system of the type comprising an energy absorbing pad having a rest volume, a flexible envelope surrounding the pad, and means for positioning the envelope over a front portion of a shoulder of a user such that the envelope is situated to come between the shoulder of the user and the stock of a firearm held by the user, the improvement comprising:

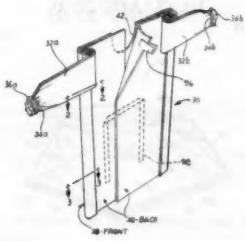
an enclosed cavity defined by the envelope, said enclosed cavity shaped to receive and confine the pad, said cavity having a volume less than the rest volume of the pad such that the envelope compresses the pad to a volume less than its rest volume, thereby enhancing recoil protection provided by the confined pad.

4,493,116

METHOD FOR MANUFACTURING SLEEVED GARMENTS

Heinz K. Niethammer, Roswell, and Lawrence J. Montgomery, Atlanta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 7, 1982, Ser. No. 415,660
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—69 **25 Claims**



1. A method for manufacturing garments from continuous webs comprising the steps of:

making flattened pairs of left and right sleeves arranged in series from longitudinally moving superposed webs of sleeve material;

transferring said flattened sleeve pairs from series to parallel shingled arrangement with cuffs sequentially aligned;

attaching elastic to aligned cuffs of said shingled sleeves;

transferring sleeves having cuff elastic from said shingled arrangement to longitudinally spaced positions on a first moving web of garment body material and attaching shoulder ends of said sleeves to said web;

combining said first web and attached sleeves with a second moving web of garment body material superposed and moving with said first moving web;

attaching said first and second moving webs and shoulder ends of said sleeves along longitudinal side seam lines at the margins of said webs and attaching said moving webs along transverse shoulder seam lines; and

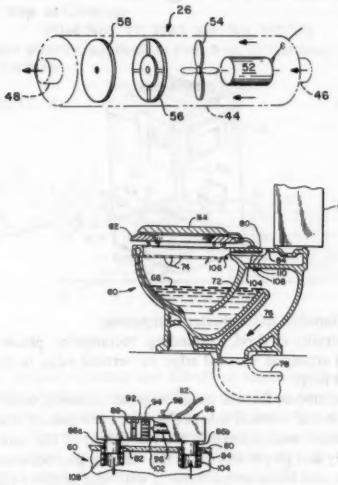
severing said moving webs including transverse cuts adjacent said shoulder seam lines to form garments.

4,493,117

CONTINUOUSLY DEODORIZED TOILET

Aldo Sguazzin, 115 Aspen Rd., Mastic Beach, N.Y. 11951

Filed Jul. 5, 1983, Ser. No. 510,558
Int. Cl.³ E03D *9/04*
U.S. Cl. 4—213 **2 Claims**



1. In a toilet having a bowl with a reservoir of water, a water closet, a region communicating with a sewer drain, and a top surface on said bowl supporting a pivoted seat, the improvement comprising a pair of spaced holes in said top surface adjacent said reservoir, a first conduit communicating the first of said holes with the interior of said bowl above the level of said reservoir, a second conduit communicating the second of said holes with said region, motor housing means mounted on said top surface, said housing means containing normally closed valve means for permitting flow of gases in only a forward direction and blocking flow of gases and liquid in the reverse direction, a fan, and a motor for driving said fan to direct flow through said valve in said forward direction, said valve means consisting of a flexible rubber diaphragm mounted on the downstream side of a grid the latter being bendable from its center and attached to said grid to allow flow of gases in one direction only, said housing means having electrical switch means for controlling operation of said motor, said housing means having connectors for insertion in said holes so that flow from said first conduit to said second conduit is in the forward

direction through said housing means whereby when said motor is energized while said toilet is in use, odor laden gases are continuously evacuated from the interior of said bowl, said housing means being readily removable by pulling said connectors out of said holes.

4,493,118

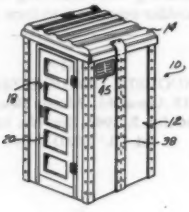
COLLAPSIBLE TOILET SHELTER

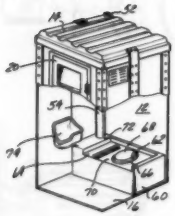
Earl J. Braxton, 50575 Ryan Rd., Utica, Mich. 48087

Continuation-in-part of Ser. No. 247,699, Mar. 26, 1981,. This application Feb. 24, 1983, Ser. No. 469,327

Int. Cl.³ A47K *11/02*; E04H *1/02*

U.S. Cl. 4—460 **13 Claims**





1. A collapsible toilet shelter comprising:

(A) a plurality of rigid, upstanding, rectangular, planar wall panels arranged vertical edge to vertical edge to form a closed loop;

(B) a continuous, flexible hinge strip permanently secured to the adjacent vertical side surfaces of each pair of adjacent panels and each extending the full height of the panels to visually and physically close the vertical gap between the panels, said hinge strips forming with said panels a continuous, vertical, articulated wall assembly permanently closed upon itself and foldably movable between

(1) an expanded condition in which it forms a closed rectangular toilet enclosure having a front wall, a back wall, and two side walls, and

(2) a collapsed condition in which it is folded flat upon itself for ease of shipment and storage;

(C) a door opening in said front wall of said enclosure;

(D) a door hingedly positioned in said door opening to provide access to said enclosure when opened and provide privacy for said enclosure when closed;

(E) a rigid rectangular base member, including a commode, adapted to be removably positioned within the bottom marginal portions of said wall panels, with said commode juxtaposed to said back wall of said enclosure, and operative when so positioned to maintain said panels in their expanded, enclosure forming condition; and

(F) a rigid rectangular roof member adapted to be removably positioned adjacent the top marginal portions of said panels and operative when so positioned to maintain said panels in their expanded, enclosure forming condition.

4,493,119

DEVICE FOR THE TREATMENT OF THE EYES WITH A WASHING OR BATHING LIQUID

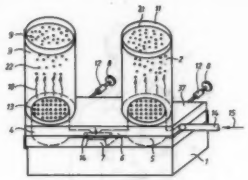
Ludwig G. Baumann, Reckholder, CH-9527 Niederhelfenschwil, Switzerland

Filed Jan. 7, 1983, Ser. No. 456,406

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200472

Int. Cl.³ A61H *33/00, 33/04*; E03C *1/05, 1/02*

U.S. Cl. 4—620 **4 Claims**



1. A device for treatment of eyes with a washing liquid comprising:

a. a container, two vertical, open topped eye bathing tubes supported by said container, each of said bathing tubes including means around said open tops to create a seal against the face of a user,

b. means located within each of said tubes to introduce gas bubbles into a body of liquid contained in said tubes,

c. support means on said container and located between said tubes to support the forehead of a user, said support means being located with respect to said tubes to support the forehead of a user when each of the user's eyes is in one of said tubes.

4,493,120

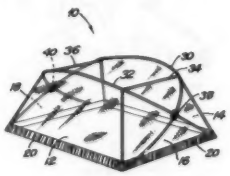
PLAYPEN

David Watts, 1326 Madison Ave., New York, N.Y. 10028

Filed Oct. 18, 1982, Ser. No. 434,767

Int. Cl.³ A47C *29/00*

U.S. Cl. 5—99 B **8 Claims**

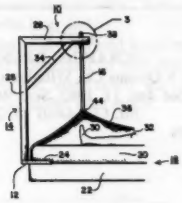


1. A portable and collapsible playpen or the like comprising a web-like flexible floor a pair of opposed side walls formed of web-like fabric held under tension by means of two segmented flexed poles, front and back walls secured to the ends of the side walls and held under tension by means of two horizontal cross members, said walls defining a substantially rectangular free standing enclosure, and hub means at either end of said enclosure for receiving and releasably retaining at least two segments of each of said poles.

4,493,121
BLANKET LIFTING DEVICE

Frank Williams, 1323 Whitney Bank Bldg., New Orleans, La. 70130

Filed Apr. 28, 1983, Ser. No. 489,479
Int. Cl.³ A47C 21/00
U.S. Cl. 5—505 3 Claims



1. A device for keeping a sheet or blanket off feet comprising:

a frame having a generally horizontal member and a vertical member, said horizontal member being attached to and extending from one end of said vertical member;

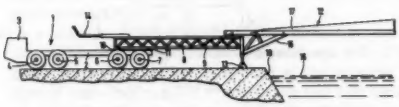
support means for maintaining said frame in a stationary position, said vertical member being connected to said support means; and

a line extending from said frame and engaging said sheet or blanket, said line having a length sufficient to maintain said sheet or blanket in a position generally above said feet, said line attached to said horizontal member at one end, said line extending downwardly so as to engage said sheet or blanket, said line extending upwardly from said sheet or blanket and the other end of said line comprising a pin removably engaged a receptacle in said horizontal member, said line engaging said sheet or blanket so as to support said sheet or blanket a distance above and out of contact with said feet.

4,493,122
MOTOR VEHICLE FOR TRANSPORTING AND LAYING A FIXED BRIDGE

Theodor Echtler, Kaiserslautern; Martin Quinot, Seichenbach, and Werner Hunsinger, Kaiserslautern, all of Fed. Rep. of Germany, assignors to IBEK Ingenieurbuero Echtler Kaiserslautern GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,198
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217435
Int. Cl.³ E01D 15/12
U.S. Cl. 14—2.4 26 Claims



1. A motor vehicle for transporting and laying a fixed bridge, comprising:

(a) a ground supported vehicle including a chassis with a front and a rear;

(b) a slide frame longitudinally displacably mounted to said chassis and having a first travel position and a second extended position wherein a first end of sad slide frame is disposed a substantial distance from said vehicle rear and said slide frame has an upper and a lower surface;

(c) a support leg secured generally to said first end having a ground engaging portion extending beyond said lower surface supporting said slide frame while in said extended position;

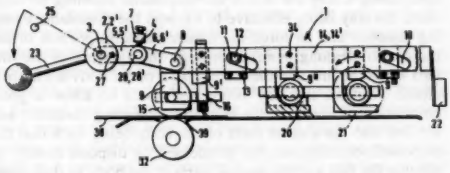
(d) a bridge member carried by said slide frame having a first position supported by said upper surface and a second position remote from said slide frame; and,

(e) bridge member laying and displacement means connected generally to said first end for displacing said bridge member and said laying means includes a rearwardly extending portion adapted for supporting said bridge member during displacement thereof whereby said laying means is adapted for being moved from a first bridge member supporting position to a second laying position for thereby laying said bridge member over an obstacle.

4,493,123
PRESSURE-CONTACT AND LIFT-OFF ARRANGEMENT

Hermann Idstein, Oestrich-Winkel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,775
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243874
Int. Cl.³ G03D 5/06
U.S. Cl. 15—4 14 Claims



1. A pressure-contact and lift-off arrangement for working elements which are sequentially arranged in a processing unit for exposed printing materials, said unit including a table surface and wherein said printing materials are guided in continuous succession across said table surface where they are developed and cleaned, said arrangement comprising:

side plates, said working elements being located between said side plates;

guide members located on inner sides of said side plates, said working elements having ends supported, respectively, in said guide members;

supporting frames positioned on opposite sides, respectively, of said working elements, said supporting frames having elongated guide holes formed therein at an angle with respect to said table surface;

hold down members associated, respectively, with said guide members, said hold down members being connected to said supporting frames and positioned above said working elements;

bearing members connected to said side plates and received in said holes, respectively, for guiding movement of said supporting frames between a raised position and a lowered position with respect to said side plates; and

means for raising and lowering said working elements in response to movement of said supporting frames guided by said holes.

4,493,124

TOILET CLEANING TOOL

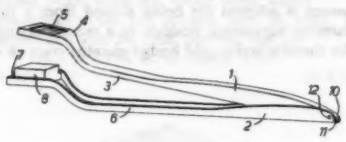
Michael Agapiou, 163 Watford Rd., Harrow, Middlesex, HA1 3UA, England

Filed Oct. 26, 1982, Ser. No. 436,696

Claims priority, application United Kingdom, Oct. 27, 1981, 8132404

Int. Cl.³ A47L 25/00

U.S. Cl. 15—104.94 4 Claims



1. A toilet cleaning tool for cleaning a lavatory bowl of a toilet, which toilet cleaning tool comprises a disposable cleaning member and a body, the body having first and second parts which define a handle and between which the disposable cleaning member is releasably retained, the disposable cleaning member comprising a centre cleaning portion and a pair of flanges, the disposable cleaning member being water degradable whereby the disposable cleaning member can be disposed of by being flushed down the toilet, the first and second parts of the body being movable between open and closed positions, the first part of the body having an aperture through which the centre cleaning portion of the disposable cleaning member projects when the first and the second parts of the body are in their closed position in which they sandwich the pair of flanges of the disposable cleaning member to retain the disposable cleaning member in position, the second part of the body comprising a tray on which the disposable cleaning member rests, the tray being effective to support the disposable cleaning member and to force the centre cleaning portion of the disposable cleaning member through the aperture in the first part when the first and the second parts of the body are in their closed position, the tray being perforated to allow a good circulation of water to the disposable cleaning member, and the first and the second parts of the body being such that the disposable cleaning member is released for disposal merely by moving the first and the second parts of the body to their open position whereby the disposable cleaning member is able to fall off of the tray under the action of gravity.

4,493,125

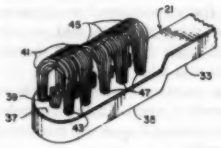
TOOTHBRUSH WITH CURVED BRISTLES

George C. Collis, 313 W. 48th St., Minneapolis, Minn. 55409

Continuation-in-part of Ser. No. 175,424, Aug. 5, 1980, Pat. No. 4,382,309. This application Mar. 14, 1983, Ser. No. 474,805

Int. Cl.³ A46B 9/04

U.S. Cl. 15—167 A 19 Claims



11. A toothbrush for brushing the buccal and lingual surfaces of teeth comprising

an elongated handle,

a bristle mounting head formed on the outer end of said handle having a bristle mounting face,

at least two rows of curved bristles,

the proximal ends of said bristles being mounted in said bristle mounting face,

at least some of said bristles having cross sections generally in the shape of a polygon with less than six sides,

the curved shape and mounting of said bristles being such that similarly positioned bristles in opposite bristle rows are symmetrically shaped and their distal extremities are nearly touching.

4,493,126

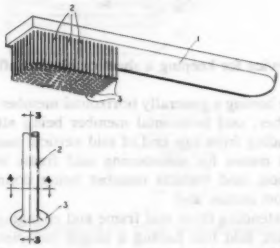
SCRAPING BRUSH

William C. Uy, 9 Queens Ct., Wilmington, Del. 19808

Filed Jan. 11, 1982, Ser. No. 338,587

Int. Cl.³ A46B 15/00

U.S. Cl. 15—186 1 Claim



1. A scraping brush comprising a handle and a base, said base having a plurality of stiff wire bristles extending perpendicularly therefrom, each of said bristles having an integrally formed, thin, flat, disc shaped terminal end member thereon defining a flat circular face, the bottom plane of the flat circular face being perpendicular to the longitudinal axis of its integral bristle, the cross-sectional thickness of each of said disc shaped terminal end members tapering radially to a sharp point, the cross-sectional area of each of said disc shaped terminal end members being taken on a plane coinciding with the longitudinal axis of the bristle.

4,493,127

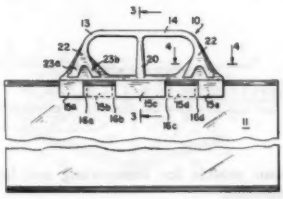
CARRYING HANDLE FOR HEAVY DUTY OLEFIN BAGS

Richard H. Blanke, Jr., Ladue, and Harold N. Cale, Chesterfield, both of Mo., assignors to Chase Bag Company, Greenwich, Conn.

Filed Aug. 16, 1982, Ser. No. 408,209

Int. Cl.³ B65D 25/28

U.S. Cl. 16—124 6 Claims



1. A molded plastic handle adapted to be sonically sealed to the upper, outer surfaces of a heavy duty olefin carrying bag for carrying 10 to 50 pounds of dry mix and like heavyweight material, comprising:

(a) a hand receiving portion having inwardly and outwardly flared ends;

(b) a depending slotted skirt portion below said hand receiving portion and connected to said flared ends, said depending skirt portion having depending alternate elements for

attachment to the outer surfaces of such olefin bag, said depending alternate elements being spaced apart to provide a slot between each pair of adjacent elements, and one said depending alternating element being disposed midway of said handle;

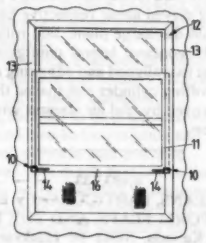
(c) each of said alternating elements being of a size and configuration not to overlap the alternating elements immediately adjacent thereto when secured to the upper surface of the olefin bag; and

(d) a vertical strut integral with said hand receiving portion of the handle and connected to said midway depending element, whereby the interrupted skirt portion is prevented from flexing under load stress.

4,493,128
WINDOW SASH POSITIONER

Jon C. Corry, Hueytown, Ala., assignor to Mason Corporation, Birmingham, Ala.

Filed Jun. 20, 1983, Ser. No. 506,284
Int. Cl.³ E05D *13/08, 17/00*
U.S. Cl. 16—197 **6 Claims**



1. In a positioner for a movable window sash adapted for movement relative to a window frame having spaced apart side members,

(a) a guide bracket carried by said sash with one side of said guide bracket being in spaced relation to and facing at least one of said side members and extending in a plane which is inclined relative to a plane extending in the direction of movement of said sash with the opposite side of said guide bracket being parallel to said one side of said guide bracket,

(b) a wedge-like member having a first surface at one side thereof in sliding engagement with said one side of said guide bracket and a second surface at the opposite side thereof extending parallel to and facing said side member adjacent thereto with said wedge-like member being movable into and out of engagement with said side member adjacent thereto in response to sliding movement of said wedge-like member in a first direction and a second direction, respectively,

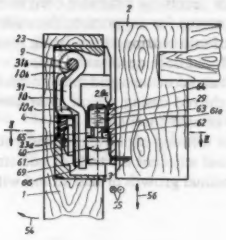
(c) an actuator mounted for sliding movement along said opposite side of said guide bracket and operatively connected to said wedge-like member to move said wedge-like member selectively in said first direction and said second direction, and

(d) resilient means urging said wedge-like member in said first direction and into engagement with said side member adjacent thereto.

4,493,129
DOOR HINGE FOR LATERAL AND HEIGHTH ADJUSTMENT

Alfred Grass, Konsumstrasse 20, A-6973 Höchst/Vlbg., Austria

Filed Apr. 8, 1982, Ser. No. 366,765
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114424
Int. Cl.³ E05D *7/04*
U.S. Cl. 16—238 **10 Claims**

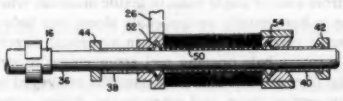


1. A door hinge for substantially concealed door-closed mounting with respect to a supporting frame member which enables dual-way direction of adjustment between a frame member and a door member which comprises, a hinge box having a back end adapted to be positioned and secured in a depthwise-inserted relation from a face portion of and within one of a frame member and a door member, a mounting plate adapted to be secured on an opposed face portion of the other of the members, a swing arm fully within the box, the swing arm having a back end portion pivotally mounted within said box to extend substantially parallel to the back of the box when the door member is in a closed position with respect to the frame member, a boss fixedly secured to the mounting plate so as to extend from said mounting plate towards said box to extend therewithin when the door member is in a closed position with respect to the frame member, said swing arm having a forward end portion extending into a cooperating position with respect to said boss, said boss having screw means cooperating with said forward end portion for mounting said swing arm in a two-way independently adjustable relation on and with respect to said boss to enable lateral as well as heighth adjustment between said box and said mounting plate after they have been secured in a mounted position on the door and frame members.

4,493,130
SHIRRED CASING ARTICLE METHOD AND APPARATUS

Algimantas P. Urbutis, Palos Heights, and Peter H. Jagel, Hinsdale, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 15, 1982, Ser. No. 434,559
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—49 **29 Claims**



13. A method of making a shirred casing article comprising the steps of:

(a) locating a shirred, and at least partly compacted, strand of casing on a tubular core, the outside diameter of said core being of a size sufficient to permit an embracing engagement of said strand about the outer periphery of said core wherein said strand exerts radial inward forces

on said core and said core being sufficiently rigid to resist the forces generated by said compacted strand of casing:

(b) positioning elements on said core adjacent the ends of said strand so as to capture and restrain the axial growth of said strand with respect to said core, the positioning of said elements being accomplished so as to permit the subsequent deshirring of casing from said strand and over at least one of said elements.

24. Apparatus for forming a casing article comprising:

(a) a shaft for receiving a tubular core member:

(b) bearing means for supporting the ends of said shaft, at least one of said bearing means being removable to permit loading of said core onto said shaft;

(c) said shaft and core being adapted to receive a compacted strand of shirred casing which embraces about the outer periphery of said core; and

(d) means for forming capturing means from the material of said core and adjacent the ends of said strand for preventing longitudinal growth of said strand with respect to said core.

4,493,131

CONTROL DEVICE FOR OPENING FIBER BALES

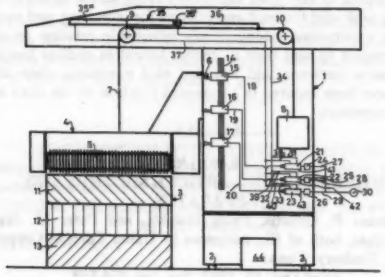
Claudio Dragagna, Pavia, and Claudio Locatelli, Capriolo, both of Italy, assignors to Fratelli Marzoli & C. S.P.A., Palazzolo Sull'Oglio, Italy

Filed Dec. 7, 1982, Ser. No. 447,685

Claims priority, application Italy, Dec. 11, 1981, 25554 A/81

Int. Cl.³ D01G *13/00*

U.S. Cl. 19—80 R **3 Claims**



1. A device for controlling a machine for removing fibre staples from a set of staple bales of textile material, wherein the machine is horizontally reciprocable along said bale set and comprises a carriage reciprocable in a vertical direction and having a rotary bale opening reel arrangement to strip from said bales fibre staples to be pneumatically conveyed to subsequent processing steps, and wherein the device comprises a plurality of detectors spaced from one another in a vertical direction according to superimposed zones of said bales having sufficient compactness, means for actuating said detectors in response to vertical movement of said carriage, and means controlled by said detectors to cause said carriage and rotary bale opening reel arrangement to exert on said bales pressures of different magnitudes according to said zones of different compactness.

4,493,132

DEVICE FOR CONDENSING THE FLEECE EMERGING FROM A CARDING ENGINE

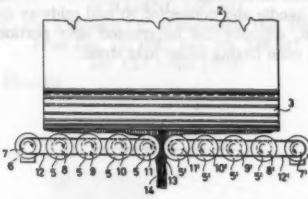
Claudio Dragagna, Pavia, and Claudio Locatelli, Capriolo, both of Italy, assignors to F. LLI Marzoli & C. S.p.A., Palazzolo Sull'Oglio, Italy

Filed Nov. 5, 1982, Ser. No. 439,540

Claims priority, application Italy, Nov. 5, 1981, 24886 A/81

Int. Cl.³ D01G *15/46*; D01H *5/72*

U.S. Cl. 19—106 R **5 Claims**



1. A device for condensing a fleece taken at an exit of a carding engine for cotton, wool, synthetic and man-made fibres by a fleece-doffer comprising a doffing cylinder, wherein the fleece taken from said fleece-doffer is conveyed to at least one discharge point for the formation of a sliver, comprising means for generating at least two air streams substantially parallel to the axis of said doffing cylinder in opposite directions on a fleece-discharge plane passing through said at least one discharge point, said means comprising a plurality of roller elements rotatably driven about respective axes arranged perpendicularly to said discharge plane, said roller elements having a substantially concave lateral configuration and being arranged in at least two aligned and adjoining sets spaced apart parallely to said doffing cylinder and spaced therefrom, so that said fleece is conveyed by said air streams without contacting said roller elements.

4,493,133

LOCKING MEANS, PARTICULARLY FOR TRUCK PLATFORM FLAPS, AND THE LIKE

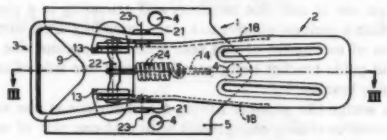
Weimar Nilsson, Karsnäs, S-561 90 Huskvarna, Sweden, assignor to Huskvarna Transtortkonstruktionar A.B., Huskvarna, Sweden

Filed Feb. 7, 1983, Ser. No. 464,577

Claims priority, application Sweden, Feb. 15, 1982, 8200901

Int. Cl.³ E05C *19/14*

U.S. Cl. 24—68 T **9 Claims**



1. Locking means, particularly for a truck platform flap of the type which comprises a base plate, an one-armed lever pivotably journaled in said base plate and having the shape of a handle, a substantially U-shaped locking yoke which is connected to the handle and pivotable in relation thereto on an axis substantially parallel to the pivot axis of the handle between locking and unlocking positions, said locking yoke being adapted to engage a hook or a recess when in said locking position for holding the flap, and at least one spring for actuating the handle and the locking yoke, said spring having one end operatively secured to the base plate and the other end operatively secured to said handle to a point which is located so that the spring on one hand urges said handle to rotate in the direction towards its locking position when the handle is

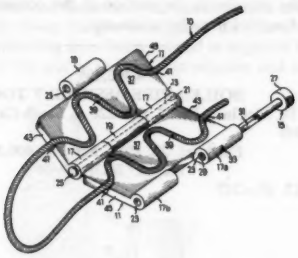
turned out from the base plate and is positioned on one side of a dead center position, and on the other hand urges said handle to rotate in the direction towards its open position when the handle is turned out from the base plate and is positioned on the other side of said dead center position.

4,493,134

ROPE CLAMPING DEVICE

Edward J. Karr, 3N430 Woodland Ave., West Chicago, Ill. 60185

Filed Nov. 22, 1982, Ser. No. 443,393
Int. Cl.³ F16B *2/02*; F16G *11/00*; H01R *13/58*
U.S. Cl. 24—132 WL **14 Claims**



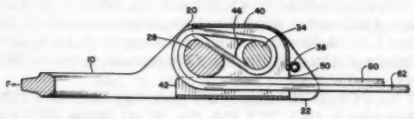
1. A rope, wire or cable clamping device comprising:
a first plate including a surface provided with a serpentine groove to receive and retain a segment of a rope, wire or cable to be clamped;
A second plate including a surface provided with a serpentine groove to receive and retain a different segment of a rope, wire or cable to be clamped;
said plates being adopted to be positioned with said surfaces in closely spaced face-to-face relation and means to releasably secure said plates in said position;
said grooves being of a depth that is less than the thickness of the segment to be clamped, positioning of said plates with said surfaces in said closely spaced face-to-face relationship compressing said segments to be clamped therebetween; and
wherein said plates are longitudinally elongated and said serpentine grooves are formed about a longitudinal cneter line thereof and extend for at least two 360° reversals of direction with respect to said centerline.

4,493,135

FITTING FOR CONNECTION WITH WEB-TYPE STRAPPING

Edward J. Crook, Jr., Tulsa, Okla., assignor to The Crosby Group, Inc., Tulsa, Okla.

Filed Mar. 28, 1983, Ser. No. 479,755
Int. Cl.³ A44B *11/00*
U.S. Cl. 24—197 **5 Claims**



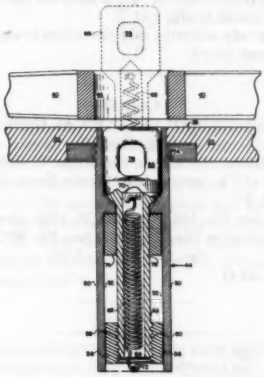
1. Apparatus to attach and adjust the length of fabric web type strap to a fitting which has rearwardly thereof two spaced parallel sides defining a top and bottom comprising:
a crossbar non-rotatably and non-movably affixed at a given position to and between said sides immediately rearward of said fitting, said crossbar of cross-section configuration having a curved surface adjoining a flat surface, the generation of said curved surface extending from its top forwardly to said bottom and rearwardly around to said flat surface which connects at its said top,
a cross-pin affixed to and between said sides rearwardly of and of parallel axis to said crossbar; and
a removable tension pin affixed to and between said sides rearwardly of and below said cross-pin.

4,493,136

PIVOTAL MONO WING CRUISE MISSILE WITH WING DEPLOYMENT AND FASTENER MECHANISM

Frederick D. Groutage, Laramie, Wyo.; Samuel N. Conjerti, and Lockburn S. Shaw, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 182,335, Aug. 29, 1980,. This application Apr. 29, 1982, Ser. No. 373,086
Int. Cl.³ A44B *11/25*
U.S. Cl. 24—573 **8 Claims**



1. A retractable device for releasably attaching a first member to a second member comprising:
a cylinder having a cylinder housing, an interior cylinder wall, a first end and a second end having means for connecting to said second member;
a piston positioned in slideable engagement with said cylinder wall;
a connecting rod having a hollow core and having extended and retracted positions and having a first end connected to said piston and a second end having means for releasable engagement with a deployment actuating mechanism connected to said first member; and
spring means connected to said connecting rod and to said cylinder housing for biasing said connecting rod towards said cylinder second end, said spring means extending through said hollow core.

4,493,137

METHOD OF MAKING A DRIVE ELEMENT ASSEMBLY FOR INK JET PRINTING

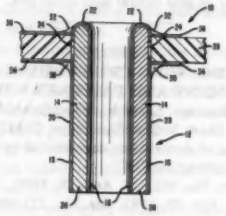
Leonhard Bader, Stadtbergen; Ferdinand Hermann, Neuaess; Wilhelm Ruprich, and Hermann Winter, both of Augsburg, all of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 19, 1983, Ser. No. 533,399
Int. Cl.³ H04R *17/00*
U.S. Cl. 29—25.35 **5 Claims**

1. A method of making a print head for use in an ink jet printer device, which comprises the following steps:
(a) providing a piezoelectric drive element, comprising a hollow body made of a piezoelectric material, and a pair

of electrodes spaced apart and thereby electrically isolated from one another on an external face of said hollow body;

(b) fitting said piezoelectric drive element through a hole in a printed circuit board, so that a portion of said hollow



body extends through said hole and the space between said electrodes on said face is between the opposite sides of said circuit board; and

(c) respectively soldering said electrodes to opposite sides of said circuit board.

4,493,138

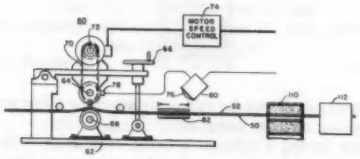
VAPOR COOLED ELECTRICAL INDUCTIVE APPARATUS

Richard D. Gibbs, Hermitage, and Roger C. Johnson, Sharpsville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 154,152, May 28, 1980, abandoned. This application May 25, 1983, Ser. No. 497,214

Int. Cl.³ B23Q *15/00*

U.S. Cl. 29—33 Q **4 Claims**



1. Apparatus for forming precisely spaced grooves in the surface of a continuously moving, elongated, metallic conductor, comprising:

a frame;

grooving means for grooving said surface of said continuously moving, elongated, metallic conductor mounted on said frame;

support means for supporting said continuously moving, elongated, metallic conductor mounted on said frame opposite said grooving means and in close proximity thereto to support said moving elongated metallic conductor beneath said grooving means;

means moving the elongated metallic conductor between and past said grooving means and said support means;

means for varying the frequency of operation of said grooving means to cause said grooving means to form grooves at a predetermined spacing into said surface of said continuously moving elongated metallic conductor;

measuring means for measuring the space between the grooves in said surface of said continuously moving, elongated metallic conductor;

the measuring means including sensing means for sensing the forming of each groove;

a stroboscopic light mounted on the frame so as to illuminate a predetermined portion of the surface of the continuously moving elongated metallic conductor when said stroboscopic light flashes; and

a spacing scale mounted on the frame to cause said spacing scale to be illuminated concurrently with said predetermined portion of the surface of the continuously moving, elongated metallic conductor when said stroboscopic light flashes, and

said stroboscopic light being electrically connected and responsive to said sensing means to cause said stroboscopic light to flash and momentarily illuminate said spacing scale and said predetermined portion of the surface of the continuously moving, elongated, metallic conductor, when said sensing means senses the forming of each groove, to obtain a momentary stationary image of said predetermined portion of the surface of the continuously moving, elongated, metallic conductor, opposite said spacing scale to permit measurement of the space between the grooves in the surface of the continuously moving, elongated metallic conductor.

4,493,139

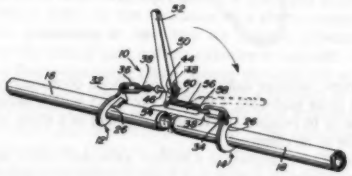
BOILER PIPE ASSEMBLY TOOL

Gary W. McClure, Rte. 7, Box 228-A, South Charleston, W. Va. 25309

Filed Jul. 20, 1982, Ser. No. 400,134

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—267 **9 Claims**



1. Boiler pipe tool comprising a pair of rigid C-shaped jaws for engaging pipe sections at opposed circumferential portions thereof, a flexible means connected to each C-shaped jaw at a location adjacent one end of the jaw and a lever having a handle portion at one end, the other end of the lever being connected to the respective flexible means at spaced points to move the jaws toward each other in response to swinging the lever, said lever having an offset portion at the end to which the flexible means are attached for providing overcenter movement of the points of attachment when the lever is pivoted to a position to force the ends of the pipe sections together and locking the tool in position to enable welding without holding the lever of the tool.

4,493,140

METHOD OF MANUFACTURING A FLEXIBLE PIPE

Gasan M. B. O. Aadullaev, ulitsa Saraikina, 27, blok 2; Faramaz G. O. Maxudov, ulitsa Gadzhibekova, 33/35; Dzhangir A. K. O. Kasimov, ulitsa Gadzhibekova, 38, kv. 39; Bakhtiyar M. R. O. Mamedov, prospekt Neftyanikov, 87, kv. 15; Gabil G. Aliev, ulitsa Gadzhieva, 42, blok 1, kv. 1; Yashar A. O. Gadzhiev, 4 mikroraion, ulitsa 7-va Binagadinskaya, 9, kv. 9; Rovshan I. O. Shakhmamedov, ulitsa Gubanova, 10, kv. 8, all of, Baku, and Alexei A. Iljushin, Chistyeprudy, 9, kv. 44, Moscow, all of U.S.S.R.

PCT No. PCT/SU80/00153, § 371 Date May 12, 1981, § 102(e) Date May 6, 1981, PCT Pub. No. WO81/00746, PCT Pub. Date Mar. 19, 1981

Division of Ser. No. 261,206, May 12, 1981, Pat. No. 4,403,631. This PCT application Sep. 1, 1980, Ser. No. 492,598

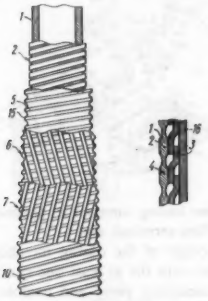
Claims priority, application U.S.S.R., Sep. 12, 1979, 2780068

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—446 **1 Claim**

1. A method for manufacturing a flexible pipe comprising an inner supporting pipe made from an elastic material, a power

frame formed by a shaped strip having a Z-shaped cross-sectional profile with two stepwise conjugated flanges, the strip being wound in a spiral fashion onto the supporting pipe such that the upper flange of each turn is disposed over the lower flange of the adjacent turn, an interlayer formed of an elastic material and superimposed onto the power frame, at least one pair of reinforcing layers including an upper and a lower layer, said reinforcing layers being formed by groups of power filaments, said filaments being parallel to one another and wound in opposed directions onto said interlayer, and an external protective shell formed of an elastic material, wherein each of said flanges is of a quadrangular cross-section and is of a height equal to one half of the height of the profile of the strip so that the upper flange of each turn rests directly on the lower flange of the adjacent turn, and the ends of the upper flanges as well as the ends of the lower flanges are aligned, the power filaments of each reinforcing layer being wound at angles of from about 0° to 20° to the axis of the pipe and wherein said inter-



layer is made from an elastic material and has a helical expansion disposed above the butt formed between the ends of the upper flanges of the turns of the strip, comprising the steps of superimposing said shaped strip, preliminarily bent in a spiral onto an inner supporting pipe defining a power frame on said support tube with said upper flange of each turn of said spiral disposed over said lower flange of the adjacent turn, and said lower flange being fixed to said support pipe, tensioning said power frame and said support tube to longitudinally stretch same, covering the longitudinally stretched power frame formed by the shaped strip with an interlayer of an elastic material with simultaneous fastening of said interlayer to the strip, winding on said longitudinally stretched power frame each of said groups of power filaments in opposite directions to form reinforcing layers, and superimposing an external protective shell, over said reinforcing layers, and releasing said tension to allow said stretched power frame and support tube to contract and compress said elastic interlayer.

4,493,141

METHOD OF JOINING SHEETS WITH A RIVET

John E. Krezak, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 218,819, Dec. 22, 1980,. This application Jan. 21, 1983, Ser. No. 460,065

Int. Cl.³ B21D *39/00*; **B23P** *11/00*

U.S. Cl. 29—509 **17 Claims**

1. The method of fastening at least two work pieces with a fatigue resistant and sealing rivet, wherein one work piece has a shallow frusto-conical countersink to receive the rivet head, the countersink terminating in a generally cylindrical bore to receive the rivet shank,

the method comprising:

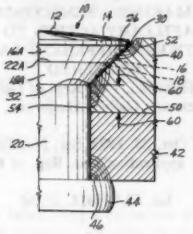
inserting a rivet shank into the bore and a rivet head into the countersink of the one work piece and inserting the rivet shank into a bore of a second work piece so that a shank end extends beyond the second work piece;

the rivet head having a distal frusto-conical portion and a proximate frusto-conical portion relative to said shank;

said proximate portion having a conical surface at a smaller angle relative to the shank axis than the conical surface of said distal portion relative to said axis;

the axial length of the proximate portion being slightly greater than the axial length of the distal portion;

said distal and proximate portions being adjoined at a common diameter;



said common diameter being the largest diameter of said proximate portion and the smallest diameter of said distal portion; and

exerting forces on the rivet head and shank end to upset the shank end on the second work piece and to deform the proximate and distal portions radially along the common diameter and both sides thereof to form a continuous conical surface in pressure relationship with a continuous conical countersink surface.

4,493,142

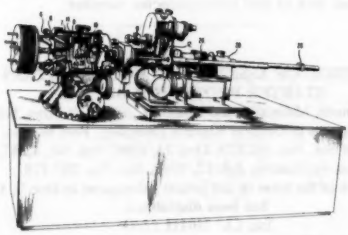
III-V BASED SEMICONDUCTOR DEVICES AND A PROCESS FOR FABRICATION

James C. Hwang, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 7, 1982, Ser. No. 376,178

Int. Cl.³ H01L *21/203, 21/477*

U.S. Cl. 29—575 **10 Claims**



1. A process for producing a device, said device based on a III–V based semiconductor material comprising the steps of depositing said III–V based semiconductor material on a substrate characterized in that

(1) a passivating layer is formed on said substrate before said deposition,

(2) said passivating layer is removed in the presence of a flux of a volatile group V entity that repairs the surface of said substrate, wherein sufficient repair is essentially completed before said deposition is initiated to yield a surface exhibiting a reflection electron diffraction pattern having essentially continuous streaks,

(3) said repair of said substrate is accomplished at a repair

temperature above the passivating layer removal temperature and below the incongruent melting temperature of said semiconductor material wherein said flux is adequate to produce a repair of said surface which is sufficient to yield a stripped electron diffraction pattern, and

(4) performing said deposition by treating said substrate with a flow containing an entity corresponding to each atom composing said semiconductor material, wherein the total flux of the volatile entities in said flow is in excess to the total flux of the nonvolatile entities in said flow.

4,493,143

METHOD FOR MAKING A SEMICONDUCTOR DEVICE BY USING CAPILLARY ACTION TO TRANSPORT SOLDER BETWEEN DIFFERENT LAYERS TO BE SOLDERED

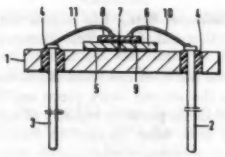
Herbert Maier, Heilbronn, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 315,296

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040867

Int. Cl.³ H01L *21/58*

U.S. Cl. 29—590 **3 Claims**



1. A method of producing a semiconductor arrangement comprising the steps of placing a thin solder wafer onto a casing support, placing a carrier member with a capillary opening onto said solder wafer so that said capillary opening is covered on the underside of the carrier member by said solder wafer, placing a semiconductor member on said carrier member above said capillary opening, and connecting said carrier member to said casing support and to said semiconductor member during a single soldering process wherein solder from said solder wafer rises due to said capillary opening and moistens the rear face of said semiconductor member.

4,493,144

METHOD OF ASSEMBLING A COMBINATION STARTER-PROTECTOR DEVICE

Lee O. Woods, Morrison, and Donald L. Haag, Sterling, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 202,873, Oct. 31, 1980, Pat. No. 4,387,412. This application Jul. 12, 1982, Ser. No. 397,275

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ H01H *11/06*

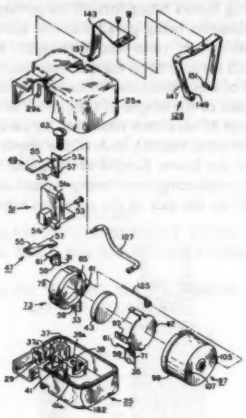
U.S. Cl. 29—622 **22 Claims**

15. A method of assembling a combination starter-protector device having a pair of casing members adapted to define a chamber therewithin and with at least one of the casing members defining an opening therethrough, a plurality of clustered apertures through the at least one casing member, a plurality of first terminals, a plurality of second terminals, a PTCR, a bimetal switch, and a terminal mounting piece, the method comprising the steps of:

arranging one of the first terminals and one of the second terminals in circuit relation with each other and mounting another of the first terminals to the terminal mounting piece;

associating the one second terminal with one of the apertures through the at least one casing member and extending the one first terminal in part through the opening of the at least one casing member;

disposing the terminal mounting piece in a position with respect to the at least one casing member so as to at least in part close the opening thereof and extending thereby the another first terminal in part through the opening of



the at least one casing member in spaced apart relation with the one first terminal; and

associating the other of the casing members generally in mating relation with the at least one casing member and the terminal mounting piece and enclosing thereby the chamber within the at least one casing member and the other casing member.

4,493,145

INTEGRATED CIRCUIT DEVICE HAVING EASILY CLEANED REGION BETWEEN MOTHER BOA'D AND CHIP CARRIERS MOUNTED THEREON

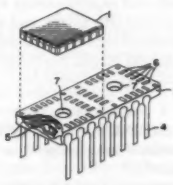
Norio Honda, Aizuwakamatsu, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 201,484, Jun. 23, 1980, abandoned. This application Oct. 19, 1983, Ser. No. 542,570

Claims priority, application Japan, Nov. 8, 1978, 53-153950

Int. Cl.³ H05K *3/34*

U.S. Cl. 29—840 **3 Claims**



1. A method for making an integrated circuit device, comprising the steps of:

forming solder pads on the bottom side of a chip carrier;

forming corresponding solder pads on the top side of a mother board;

positioning the chip carrier on the mother board so that the solder pads of the chip carrier are adjacent the corresponding solder pads of the mother board;

heating the solder pads to melt the solder and join the corresponding solder pads; and

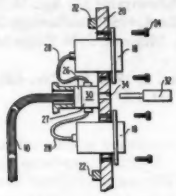
circulating solvent between the chip carrier and the mother board through an opening in the mother board.

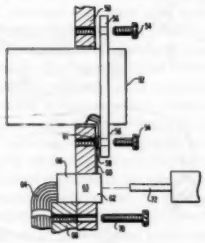
4,493,146

QUICK ATTACH DETACH INSTRUMENT PANEL METHOD

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 107,414, Dec. 26, 1979, Pat. No. 4,367,513. This application Dec. 14, 1981, Ser. No. 330,212
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—857 **4 Claims**





4. A method of mounting an instrument within a panel comprising the steps of:

(a) providing a panel having an aperture adapted to receive an instrument and having one mating portion of a zero insertion force electrical connector electrically connected to electrical wiring behind the panel;

(b) providing an instrument having an electrical conductor terminating in the other mating portion of the zero insertion force electrical connector, the length of the conductor being such as to permit withdrawal of the instrument from the panel from the front thereof without disconnecting the zero insertion force connector;

(c) mating the two portions of the zero insertion force connector with the instrument not secured to the panel and in front of the panel and with the conductor extending through the aperture for the instrument;

(d) operating the zero insertion force connector from the front side of the panel to establish an electrical connection between the instrument and the electrical wiring behind the panel;

(e) inserting the instrument into the panel from the front thereof; and,

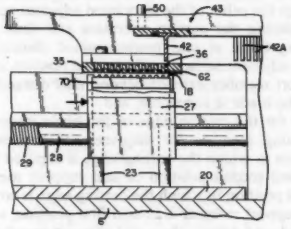
(f) mechanically securing the instrument to the panel from the front thereof.

4,493,147

APPARATUS FOR FABRICATION OF A CROSSOVER WIRE HARNESS

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 1, 1982, Ser. No. 432,211
Int. Cl.³ H01R *43/04*; B23P *19/00*
U.S. Cl. 29—861 **9 Claims**



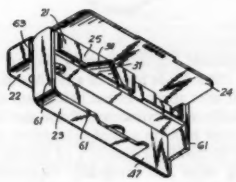
1. A method for fabricating a crossover wire harness comprising the steps of: feeding a plurality of electrical wires to a wire holder, holding the wires in the wire holder horizontally of their lengths without the wires crossing over one another, transporting an electrical connector assembly relative to the wire holder to align a respective wire position of the connector assembly with a selected held wire, transferring the selected held wire from the wire holder into the aligned wire position of the connector assembly, and holding the remaining wires by the wire holder elevated in respect to the connector assembly and the wires previously transferred thereto during transport of the connector assembly relative to the wire holder.

4,493,148

CORRUGATED CARTON CUTTER

Stanley L. Ruff, 9 Arbor Dr., New Rochelle, N.Y. 10804

Filed Oct. 3, 1983, Ser. No. 538,157
Int. Cl.³ B26B *29/02*
U.S. Cl. 30—2 **27 Claims**



1. An arrangement for holding a cutting blade having at least one cutting edge, particularly for use as a utility knife for opening filled boxes, especially of corrugated board which include associated adjacent box surfaces that meet at respective edges, comprising:

a support member for the blade having a major surface and a contact surface substantially normal to said major surface and operative for contacting one of the associated adjacent surfaces of the box during the cutting operation;

means for dismountably holding the blade on said major surface in an active position in which the cutting edge of the blade is at least partially situated beyond said contact surface of said holding member to penetrate into the re-

spective box next to said contact surface during the cutting operation;

a confining member having a distancing surface substantially parallel to and spaced a predetermined distance from the blade;

means for mounting said support member on said confining member for movement relative thereto between a first position in which said confining member confines the blade between itself and said major surface and said distancing surface extends beyond said contact surface to engage the other of the associated adjacent surfaces of the box during the cutting operation and thus to keep the cutting blade at said predetermined distance from the other adjacent surface, and a second position in which said support member extends beyond said distancing surface, and the blade is accessible; and

a cover for the cutting edge of the blade mounted on said confining member for displacement between an open position in which the cutting edge is exposed both in said first and second position of said support member and a closed position in which the cutting edge is covered when said support member is in said first position, and exposed beyond said cover when said support member is in said second position thereof, said cover including means for confining said blade between itself and said major surface, and means for keeping said support member in said second position thereof, in said closed position of said cover.

4,493,149

RECIPROCAL BLADE ASSEMBLY OF ELECTRIC SHAVER

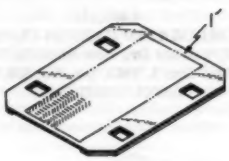
Masao Tanahashi; Toshio Tanabe, and Kiyotaka Otsuka, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 191,518, Sep. 29, 1980, abandoned. This application Sep. 14, 1982, Ser. No. 418,083

Claims priority, application Japan, Mar. 15, 1980, 55-33271; May 27, 1980, 55-70924

Int. Cl.³ B26B *19/04*

U.S. Cl. 30—43.92 **2 Claims**



1. A reciprocable blade assembly for an electric shaver comprising an outer blade made of a flexible steel foil having a plurality of hair inlet apertures and being bent from a flat shape into a substantially semi-cylindrical shape and fixed to the head part of said shaver to form a semi-cylindrical outer blade, and an inner cutter including a plurality of blades each having an arcuate cutting edge and integrally supported substantially parallel with each other so that said cutting edges contact the inner surface of the semi-cylindrical outer blade, said inner cutter being reciprocably mounted to slide along the inner surface of the outer blade in the direction of the longitudinal axis of said semi-cylindrical outer blade, said outer blade being provided with an elongated bent part recessed inwardly and extending in a direction parallel to said longitudinal axis of the semi-cylindrical outer blade, said bent part including side walls extending to adjacent surface parts of the outer blade on both sides of said bent part, said hair inlet apertures including a plurality of slit-shaped apertures disposed within said side walls and extending transversely of said direction and outwardly to said adjacent surface parts of the outer blade, said arcuate cutting edges of said blades of the inner cutter being provided with an edge defining an incision for receiving the recessed bent part of the outer blade, each of said slit-shaped apertures comprising a portion disposed in said side walls and intersecting at right angles the longitudinal axis of the outer blade and a portion disposed in said adjacent surface parts, said hair inlet apertures further comprise shorter slits disposed in said adjacent surface parts and longer slts longer than said shorter slits but shorter than the slit-shaped apertures disposed in the adjacent surface parts, said bent part of the outer blade being substantially V-shape in cross-section, and said incision of the respective inner cutter blades being substantially U-shaped having a bottom edge spaced from a tip end of said V-shaped bent part, restricting means being provided in said U-shaped incision of the inner cutter blades, said restricting means having a groove receiving the apex of said V-shaped bent part of the outer blade and opposing the apex through a slight clearance.

4,493,150

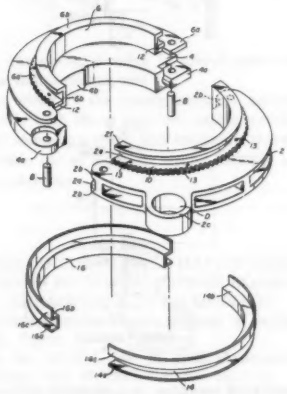
PIPE CUTTER WITH SPLIT RING FRAME AND ENCLOSED FEEDING MEANS

Carlos M. Garcia, 225 Sunnyside St., Apt. 15, Bldg. 14, Houston, Tex. 77076; I. Ely Reed, 4050 Heathersage Dr., Houston, Tex. 77084, and Dale K. McLeod, 5926 Pinewilde, Houston, Tex. 77066

Filed Nov. 5, 1982, Ser. No. 439,411

Int. Cl.³ B26D *3/16*

U.S. Cl. 30—97 **3 Claims**



1. An apparatus for cutting pipe comprising

a split ring frame;

means for attaching the frame to a pipe;

a split ring carrier rotatably mounted to the frame;

means for driving the split ring carrier about the frame;

a cutter arm;

means for pivotally attaching the cutter arm to one of the carrier rings;

a cutting tool movably attached to the cutter arm so that the cutting tool can move in the raidal direction relative to the pipe being cut;

feeding means for advancing the cutting tool towards the center of the pipe being cut, the feeding means being mounted in the cutting arm, frame and carrier so that the entire feeding means is interior of the outer periphery of the frame and carrier and exterior of the inner periphery of the frame and carrier, the feeding means being activated by rotation of the split ring carrier relative to the frame, said feeding means including a shaft which is rotatably attached to one of the carrier gear rings and the cutter arm, said shaft providing the means for pivotally attaching the cutter arm to one of the carrier rings;

a split feed gear ring with a plurality of outwardly projecting teeth mounted to the frame; and

a feed pinion gear with a plurality of outwardly projecting teeth attached to the shaft, the teeth of said feed pinion gear meshing with the teeth of the feed gear ring as the split ring carrier rotates about the split ring frame.

4,493,151

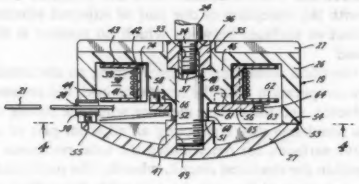
APPARATUS FOR CUTTING VEGETATION

Albert W. Mitchell, Houston, Tex., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 144,062, Apr. 28, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,226

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **26 Claims**



1. An apparatus for cutting vegetation, comprising:

a rotatable head member,

at least one spool rotatably supported on said head member for rotation relative to said head member and having a coiled supply of cutting line wound about said spool;

guide means disposed on said head member for guiding an end portion of cutting line from said spool to the exterior of said head member whereby said end portion of said cutting line is extended from said head member by centrifugal force upon rotation of said head member;

means for rotatably driving said head member;

a control member engageable with a portion of said cutting line and movable between a first position and a second position on said head member and relative to said spool, said control member being engaged with said spool to restrain rotation of said spool relative to said head member while said control member is disposed in said first position and said second position and to release said spool for rotation relative to said head member while moving from said first position to said second position, thereby increasing the length of said end portion of said cutting line by a selected amount;

said control member being movable from said first position to said second position in response to a shortening of said end portion of said cutting line extending from said head member during rotation of said head member and being movable from said second position to said first position in response to an increase in length of said end portion of said cutting line extending from said head member and uncoiled from said spool during movement of said control member between said first and second positions.

4,493,152

LETTERING MACHINE

Osamu Ono, Tokyo, Japan, assignor to Nakuru Inc., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,677

Int. Cl.³ B43L *13/10*

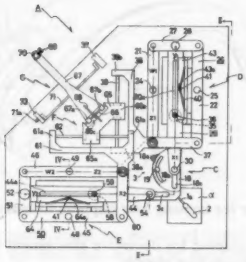
U.S. Cl. 33—25 R **10 Claims**

1. A lettering machine comprising:

a tracer support mechanism means supporting a tracer means at a corner such that said tracer means can be freely moved to trace a letter or the like engraved on a tracing pattern plate;

a parallelogrammic horizontal component transmission mechanism means coupled directly to said tracer support mechanism means and capable of transmitting the horizontal component of the tracing motion of said tracer means on an equal scale, an enlarged scale or a reduced scale;

a parallelogrammic vertical component transmission mechanism means coupled to said tracer support mechanism means and capable of transmitting the vertical component of the tracing motion of said tracer means on an equal scale, an enlarged scale or a reduced scale;



a resultant motion reproducing mechanism means coupled to said parallelogrammic horizontal and vertical component transmission mechanism means and capable of combining the horizontal and vertical components of tracer motion transmitted from said respective transmission mechanism means to reproduce the tracer motion on an equal scale, an enlarged scale or a reduced scale; and

a writing tool support mechanism means coupled to said resultant motion reproducing mechanism means and capable of mounting a writing tool at a free end.

4,493,153

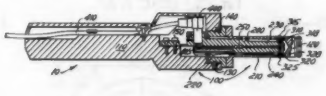
MEASURING APPARATUS AND METHOD OF MAKING

Robert L. Esken, Clayton, Ohio, assignor to The Bendix Corporation, Cleveland, Ohio

Continuation of Ser. No. 205,206, Nov. 10, 1980, abandoned. This application Oct. 7, 1983, Ser. No. 540,096

Int. Cl.³ G01B *7/12*

U.S. Cl. 33—149 J **16 Claims**



1. A measuring apparatus for measuring distance between two surfaces, said measuring apparatus comprising:

a housing;

contact tips for engaging the surface to be measured;

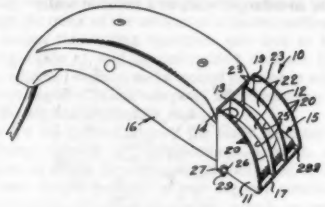
means for mounting the contact tips to the housing while allowing the tips to displace with respect to the housing in response to contact with the surfaces to be measured, said mounting means comprising a one-piece spring member mounted to the housing toward one end of the spring member, said spring member including a pair of flexible arms extending outwardly and coupled medially at an integral cross member, said arm pivoting about the cross member in response to movement of one of the tips; and

means for measuring the pivotal movement of the spring members as an indication of the displacement of said contact tips, thereby indicating the distance between the surfaces, said measuring means being coupled to the housing and at least one of said flexible arms.

4,493,154
TAPER GAUGE DEVICE FOR HAIR CLIPPERS

Gabriel E. Pascual, 1111 Bishop St., Room 1, Honolulu, Hi. 96813

Filed Jun. 18, 1982, Ser. No. 389,944
Int. Cl.³ B26B 19/38
U.S. Cl. 33—185 R 5 Claims



1. A device for causing hair clippers to make a tapered cut, comprising

a member adapted for operative attachment to a comb-type power driven hair clipper,

said member having a curved surface engageable with the hair at the back of a human head for rolling movement upwardly from the neck, and

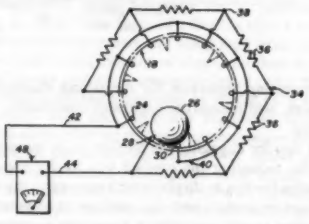
means formed for effecting a pivotal mounting of said member on said hair clipper with said curved surface extending beyond the cutting end of said hair clipper,

said curved surface being eccentric with respect to the axis of said pivotal mounting whereby pivoting of said member on said hair clipper as said curved surface is rolled upwardly against the back of the head causes the forward end of said clipper to move gradually further away from said head and thus increase the length of the hairs being cut.

4,493,155
APPARATUS FOR REMOTELY INDICATING ANGULAR POSITION

Joseph H. Comeau, Suffield; Joseph E. Kowles, Wethersfield; John P. Lareau, Granby; Kenneth R. Mayo, Enfield, and Herbert A. Runde, Windsor Locks, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 29, 1982, Ser. No. 427,241
Int. Cl.³ G01C 9/10
U.S. Cl. 33—366 5 Claims



1. Apparatus for remotely indicating the angular position of a probe about a rotational axis with respect to the horizontal, comprising:

a cage of substantially cylindrical shape mounted upon said probe and rotatable therewith, the centerline of the cylindrical cage being substantially parallel to said rotational axis;

a plurality of electrically conductive surfaces disposed upon the inner surface of the cage, each conductive surface being electrically isolated from each other conductive surface and from the cage, the number of surfaces being a multiple of two;

an electrically conductive rolling member of spherical configuration freely moveable within the cage under the influence of gravity for simultaneously contacting one pair of adjacent conductive surfaces when the cage centerline is in a substantially horizontal orientation, the particular pair of surfaces contacted being dependent upon the relative position of the cage with respect to the gravitational vector;

a common conductor in electrical communication with alternate conductive surfaces;

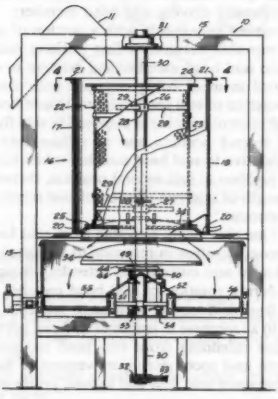
a plurality of resistors of known resistance forming a resistance grid, each individual resistor electrically located between adjacent alternate conductive surfaces not in electrical communication with the common conductor, with the exception of one pair of adjacent alternate conductive surfaces between which no resistor is disposed; and

an electrical measuring device, forming an electrical circuit in cooperation with the resistance grid, the common conductor, and the rolling member when the rolling member is simultaneously contacting an adjacent pair of conductive surfaces, for determining the total resistance present within the electrical circuit, whereby the particular pair of conductive surfaces in contact with the rolling member may be established and the angular position of said probe indicated.

4,493,156
PRODUCE SPIN DRYER

Robert L. Siegmann, 1270 North Grove, Anaheim, Calif. 92806

Filed Jun. 29, 1983, Ser. No. 508,822
Int. Cl.³ F26B 5/08
U.S. Cl. 34—8 2 Claims



1. In a method of drying produce by spinning the produce in a foraminous walled container having a removable bottom wall at a first rotative speed for centrifugally removing moisture from the produce, the improvement comprising the steps of:

reducing the speed of rotation below said first rotative speed and below the speed at which the produce is centrifugally held to the foraminous container;

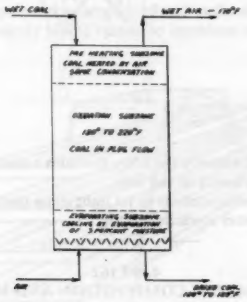
removing the container bottom wall to allow the dried produce to fall from the container while it is rotating at the reduced speed; and

reciprocating the container about its axis of rotation while the container bottom wall is removed so as to shake loose any produce adhering to the foraminous container.

4,493,157
METHOD OF AUTOGENOUSLY DRYING COAL

Gordon R. Wicker, Lakewood, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Aug. 15, 1983, Ser. No. 523,377
Int. Cl.³ F26B 3/08
U.S. Cl. 34—10 4 Claims



1. A method of drying as-mined coal having a size two inches and less and containing about thirty percent moisture comprising:

(a) providing said coal in an autogenous drying zone having subzones consisting of a preheating, an oxidation and an evaporative cooling subzones,

(b) passing in a uniformly distributed manner, ambient air into said evaporative subzone such that the coal and said gas are moving countercurrent to each other, and exothermic oxidation of the coal occurs in the oxidation subzone to produce heated flowing gases and dried coal, whereby in the evaporative subzone the heated dried coal further dries by evaporating moisture therefrom and the heated gases in said preheating zone heat the incoming moist coal,

(c) removing the heated moisture laden gases from the preheating zone,

(d) removing the dried coal from the evaporative subzone, and

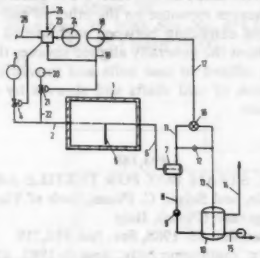
(e) regulating the movement of air relative to the coal in said autogenous drying zone to achieve by exothermic oxidation a temperature of the gases in the oxidation subzone of about 180° to 220° F. and not greater then about 250° F. and yielding dried coal containing from 5 to 15 percent moisture.

4,493,158
METHOD AND APPARATUS FOR REMOVING CONDENSATE FROM A CYLINDER, IN PARTICULAR A CYLINDER FOR DRYING PAPER

Rudi van Os, Ulestraten, Netherlands, assignor to Koninklijke Nederlandse Papierfabrieken N.V., Ak Maastricht, Netherlands

Filed Oct. 12, 1982, Ser. No. 433,914
Claims priority, application Netherlands, Oct. 13, 1981, 8104656
Int. Cl.³ F26B 3/24, 13/18
U.S. Cl. 34—41 7 Claims

1. A method for removing condensate from a cylinder, in particular a cylinder for drying paper to which a fluid under pressure is supplied via a first conduit and with which means are coupled for removing that fluid via a second discharge conduit, said method including the steps of: separating the fluid in the discharge conduit of the cylinder into a gaseous component and a liquid component and measuring and keeping constant the quantity of the gaseous component, said method being characterized in that a source of steam is coupled via a first controllable valve with the fluid supply conduit and a source of compressed air is coupled via a second controllable valve to said fluid supply conduit and said method being further characterized in that the quantity of gaseous components is kept constant by the steps of controlling the degree of opening of said first valve and, when said first valve has been opened to a predetermined position, by controlling the degree of opening

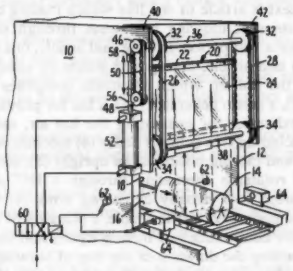


of said second valve when the measured quantity of gaseous components is too low and, when the measured quantity of gaseous components is too large, controlling the degree of opening of the second valve and, when said second valve is fully closed, controlling the degree of opening of said first valve.

4,493,159
SHRINK TUNNEL WITH MOVABLE GATE

Rudolph W. Schutz, Walnut Creek, and Rudolf R. Weis, Antioch, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jun. 8, 1983, Ser. No. 502,405
Int. Cl.³ F26B 15/18
U.S. Cl. 34—43 6 Claims



1. In combination:

a shrink tunnel defining an interior for temporarily accomodating an article to be shrink wrapped while said article is conveyed through said tunnel and additionally defining an egress opening through which said article exits from said interior after being shrink wrapped;

a gate moveable between a first position whereat said gate substantially closes said opening and a second position whereat said opening is open and provides communication between the tunnel interior and the ambient atmosphere;

prime mover means operatively connected to said gate for moving said gate between said first and second positions;

sensing means operatively connected to said prime mover means for sensing the location of said article, said prime mover means moving the gate from the first position to the second position when the conveyed article is approaching said egress opening and returning the gate to

said first position after said article has exited from said egress opening; and

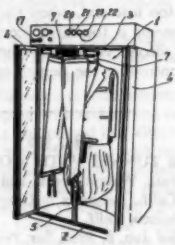
gate transport means mounted on said shrink tunnel and supporting said gate, said gate transport means operatively connected to said prime mover means and including a pair of spaced rotatable shafts, a pair of sheaves mounted on each of said shafts at spaced locations thereon whereby the sheaves mounted on one shaft are in general alignment with the sheaves mounted on the other of said shafts, and endless belts extending between said spaced shafts and disposed about the generally aligned sheaves thereof, said gate being affixed to said belts and movable therewith upon rotation of said shafts and sheaves by said prime mover means.

4,493,160

AUTOMATIC STEAM BOX FOR TEXTILE ARTICLES

Almiro Brembilla, and Sergio C. Pisani, both of Via Morosini, 16, 27029, Vigevano (Pavia), Italy

Filed Jul. 25, 1983, Ser. No. 516,719
Claims priority, application Italy, Aug. 2, 1982, 22693 A/82
Int. Cl.³ D06F *71/16*
U.S. Cl. 38—14 **4 Claims**



1. An apparatus for automatically carrying out the ironing cycle of a textile article or the like which ironing cycle comprises the steps of blowing hot steam through said article, providing for a rest period, ironing said article, circulating hot air through said article, drying said article by ventilation and exhausting the hot air, which apparatus comprises a box-like structure (1), a steam generator (18), a fan for providing ventilation, an exhauster for exhausting the hot air, said box-like structure including two bellows doors (4) mechanically driven to opening and closing positions, an upright (5), mechanically driven and rotatable alternately through a 180° angle, said upright bearing two radially extending arms (6) which are adapted to support said textile article, a plurality of timers (20, 21, 22, 23) for controlling said ironing cycle, said timers being capable of setting the duration of the step of blowing in steam, controlling the rest period, the ventilation step, the hot air exhausting period, said upright (5), upon rotation, being capable of closing said bellows doors (4), to start the ironing cycle, said article being located within said box-like structure supported by one of said radially extending arms, said doors being capable of opening at the end of said ironing cycle.

4,493,161

TRAP FOR FLYING INSECTS

Richard Soloway, 1025 Seawane Dr., Hewlett Harbor, N.Y. 11557, and Enzo Capalvo, 12 Hamilton Pl., Garden City, N.Y. 11530

Filed Dec. 20, 1982, Ser. No. 450,968
Int. Cl.³ A01M *1/00, 1/04*
U.S. Cl. 43—107 **4 Claims**

1. A flying insect trap comprising:

a hollow body having a bottom portion,

a plurality of legs connected to said body, said body having an aperture in its bottom portion,

a plurality of baffles mounted inside the body and extending upwardly and converging to form a small opening,

the body being shaped and colored to resemble the body of

an animal whereby the body provides a means for visually luring the insect to the trap,

the baffles being screens to let light shine through to attract flying insects towards the top.

4,493,162

SEED COATING COMPOSITION AND METHOD

Ervin C. Langan, Atchison, Kans., and Howard W. Christie, Raytown, Mo., assignors to W.E.F.C.O., Inc., Atchison, Kans.

Continuation-in-part of Ser. No. 190,490, Sep. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 115,181, Jan. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 10,301, Feb. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 824,052, Aug. 12, 1977, abandoned. This application Dec. 27, 1982, Ser. No. 453,797
Int. Cl.³ A01C *1/06*
U.S. Cl. 47—57.6 **12 Claims**

1. A seed treated for delay in germination after planting thereof, comprising:

a crop seed;

a coating on said seed for preventing normal germination of the seed for a period of time after planting thereof,

said coating including the dried, relatively rigid and water insoluble residue of a synthetic resin, and a filler material admixed with and incorporated into said synthetic resin which reacts with moisture and expands, the amount of said resin and filler being correlated for preventing germination for said period of time, and with said filler being present in an amount for slowly reacting with moisture from the earth after said seed is planted therein with consequent expansion of the filler material, and for causing said coating to rupture after a period of time from the planting of said treated seed by virtue of said filler material expansion, in order to then allow said seed to germinate.

4,493,163

HYDROPONIC CULTURE METHOD FOR ANIMAL FOOD AND DEVICE FOR CARRYING OUT SAID METHOD

Christian de Monbrison, Paris, France, assignor to Agro-Technics International Ltd., London, England

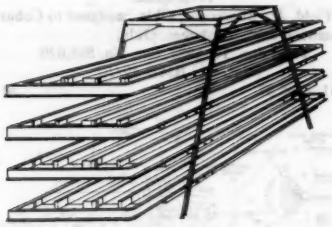
Filed Apr. 1, 1982, Ser. No. 364,180
Claims priority, application France, Apr. 2, 1981, 81 06666; Mar. 2, 1982, 82 03444
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—61 **3 Claims**

1. A device for carrying out hydroponic culture for producing fodder for animal food from seeds which comprises a framework open to the atmosphere provided with supports on which rest a number of superimposed culture trays, each culture tray being provided with

(a) a double bottom having an upper and lower plate, an electrical heating device fixed within said double bottom, an insulating plate disposed between said heating device and said lower plate such that a layer of air is provided

between said heating device and said upper plate, wherein said upper plate is longitudinally inclined and carries horizontally leveled longitudinal ribs which support inner perforated trays containing said seeds, whereby a space is provided between said upper plate and the bottom of said inner trays, between said longitudinal ribs, such that water supplied in said space soaks or irrigates the seeds and roots contained in said inner trays or drains through a water draining system downstream of said inclined upper plate,

(b) a water supply piping system to introduce soaking water



or irrigating water in said culture tray at the bottom thereof,

(c) a draining system for draining said soaking water or irrigating water,

(d) programming means for controlling the water supply system and the draining system to regulate the soaking time, the irrigation time and the quantity of water supplied for soaking or irrigating, and

(e) means for controlling the heating system of said culture tray to maintain the seeds and roots at a constant temperature.

4,493,164

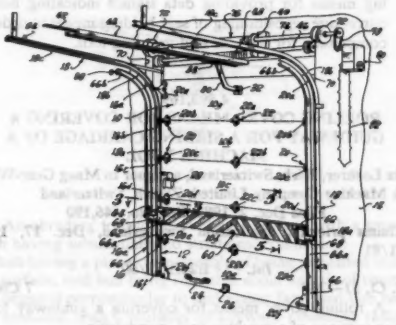
METHOD AND APPARATUS FOR DOOR PROTECTION

Richard P. Wagner, 825 Casa Loma Dr., Reno, Nev. 89503

Continuation of Ser. No. 198,450, Oct. 20, 1980, Pat. No. 4,356,668. This application Aug. 12, 1982, Ser. No. 407,470

Int. Cl.³ E06B *65/04*

U.S. Cl. 49—65 **2 Claims**



1. Apparatus for preventing passage through a door opening comprising in combination: a structure containing a door opening; a door movable with relation to such door opening so that the entire door opening or any portion thereof may be closed depending upon the position of the movable door; door position detection means operable by means cooperable with said door so as to detect a predetermined position of closure of the door opening; barrier means independent of said door to prevent access through the door opening; and means activated by the said detection means to remove said barrier means from its position with relation to said door opening.

4,493,165

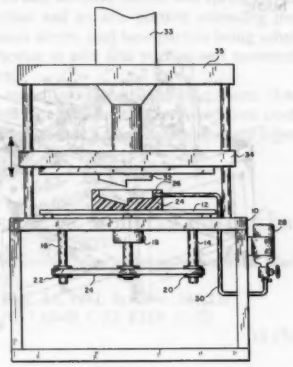
ORBITAL POLISHER WITH ELASTIC ABRASIVE

Marten C. Hausermann, Addison, and Elmer P. Hausermann, Bensenville, both of Ill., assignors to Hausermann Abrading Process Company, Addison, Ill.

Filed Mar. 10, 1983, Ser. No. 474,150

Int. Cl.³ B24B *19/00*

U.S. Cl. 51—58 **3 Claims**



1. Apparatus for polishing workpieces, said apparatus comprising

a base member;

a first platen disposed on and supported by said base member and free to move in any direction in the horizontal plane with respect to said base member;

means coupled to said first platen for driving said first platen in horizontal oscillatory rotary motion with respect to said base member;

a resilient, non-abrasive polishing die fixed to the upper surface of said first platen;

a second platen mounted in a superimposed relation and adapted to be driven vertically with respect to said first platen;

means for mounting a workpiece to said second platen in substantial vertical alignment with said resilient polishing die;

vertical drive means for incrementally infeeding said workpiece and said polishing die into contact with one another while said first platen is driven in horizontal oscillatory motion;

means for injecting an elastic abrasive composition into said polishing die when said workpiece is in contact therewith.

4,493,166

ULTRA PRECISE TOOL FORMING APPARATUS

Howard G. Lange, Prospect Heights, and Francis M. Ray, Schaumburg, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 4, 1982, Ser. No. 432,475

Int. Cl.³ B24B *17/02*

U.S. Cl. 51—100 R **6 Claims**

1. An ultra precise apparatus for forming a complex profiled face on a tool blank, said apparatus comprising:

an abrading device;

spindle means comprising a journal for supporting said abrading device;

first gaseous lubricant bearing means for rotatably supporting said journal;

a platform supported (1) for rotation about a predetermined

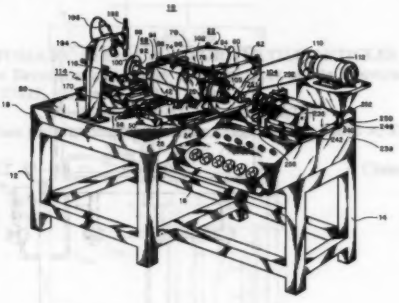
fixed pivot axis and (2) for displacement in a two-dimensional plane disposed perpendicular to said fixed pivot axis;

second gaseous lubricant bearing means for supporting said fixed platform for rotation about said pivot axis;

third gaseous lubricant bearing means for supporting said platform for displacement in said two-dimensional plane;

chuck means, mounted upon said platform, for holding said tool blank and for presenting said tool blank to said abrading device;

cam means disposed adjacent said platform and having a surface of a predetermined contour related to the profile of said complex profiled face to be formed on said tool blank;



cam follower means supported for engagement with said cam surface;

means responsive to displacement of said cam follower means by said cam surface for selectively positioning said platform in said two-dimensional plane along a platform axis orthogonally intersecting said fixed pivot axis; and

means for rotating said platform about said predeterminded fixed pivot axis and for effecting a relative travel between said cam follower means and said cam surface to selectively position said platform in said two-dimensional plane along said platform axis while said tool blank is presented to said abrading device, thereby causing said abrading device to generate said complex profiled face on said tool blank.

4,493,167

CHAMFERING MACHINES, PARTICULARLY FOR GLASS SHEETS

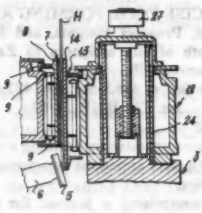
Luigi Bovone, Regione Pernigotti, 15070 Belforte Monferrato (Alessandria), Italy

Continuation of Ser. No. 384,682, Jun. 3, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,838

Claims priority, application Italy, Jun. 11, 1981, 22248 A/81

Int. Cl.³ B24B *9/10*

U.S. Cl. 51—110 **4 Claims**



1. A chamfering machine for a work piece and particularly for a glass sheet, the machine comprising a front belt and a rear belt each having an upper and lower edge and a vertical or substantially vertical axis for gripping and conveying the glass sheet along a set of tools adapted to machine an edge of the glass sheet, and means for adjusting the height of the rear belt to vary the distance between the lower edges of the front and rear belt respectively so that work pieces of different sizes can be accommodated by the machine.

4,493,168

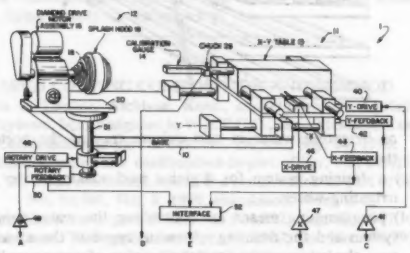
CALIBRATION GAUGE FOR COMPUTER-CONTROLLED LENS GENERATOR, OR THE LIKE

Edgar L. Field, Jr., Muskogee, Okla., assignor to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Jun. 16, 1983, Ser. No. 505,020

Int. Cl.³ B24B *49/10*

U.S. Cl. 51—165.87 **30 Claims**



1. In a computer-controlled lens generating arrangement for generating a finished lens having desired parameters, comprising:

holding means for holding a lens to be ground,

grinding means for grinding said lens to generate said finished lens, and

control means for generating electrical control signals in accordance with said desired parameters to actuate said grinding means to generate said finished lens,

said grinding means comprising a grinding tool which is prone to become worn;

a calibration gauge having means for mounting in said holding means for providing data signals indicating needed corrective repositioning of said holding means in order to compensate for wear of said grinding tool.

4,493,169

ROLLING COVER MEANS FOR COVERING A GUIDEWAY FOR A SLIDING CARRIAGE OF A MACHINE TOOL

Fritz Lochrer, Bäch, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Filed Dec. 2, 1982, Ser. No. 446,190

Claims priority, application Switzerland, Dec. 17, 1981, 8061/81

Int. Cl.³ B24B *55/00*

U.S. Cl. 51—268 **7 Claims**

1. A rolling cover means for covering a guideway for a sliding carriage of a machine tool, comprising:

two rolling bands each affixed to said sliding carriage with one of its ends;

said rolling bands each extending away from said sliding carriage along said guideway in one respective direction;

said guideway having two ends;

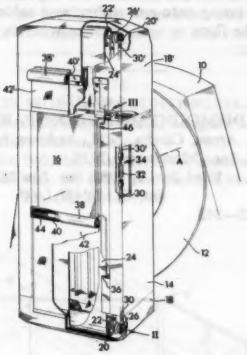
two drums each of which is disposed at the region of a respective one of said ends of said guideway;

each of said drums being rotatably mounted for rotation about an axis extending transversely relative to a longitu-

dinal direction of said guideway and serving to wind-up and unwind a respective related one of said rolling bands;

two wheels each of which is rigidly coupled in torque-transmitting relationship to a respective one of said drums;

a tension member extending around both said wheels and capable of being rolled-off substantially free of slip from said wheels;



each of said wheels serving to wind-up said tension member;

said tension member terminating at both said wheels and extending around the same in a direction opposite to that of the rolling band at the drum associated with the related wheel; and

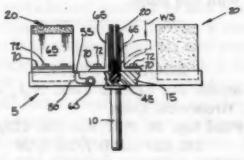
said tension member being structured to be elastically elongatable.

4,493,170

ABRADING TOOL

Randolph T. Hanger, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 19, 1981, Ser. No. 323,017
Int. Cl.³ B24D *9/08*
U.S. Cl. 51—330 **1 Claim**



1. An abrading tool for providing a surface with a smooth finish having substantially no striations, comprising:

a hub having a planar face capable of being presented to said surface, said hub being rotatable about an axis of rotation oriented perpendicular to said planar face, said hub being provided with a plurality of keyways extending radially outwardly from said axis of rotation and being disposed proximate the periphery of said hub, each of said keyways communicating with said planar face through a slot extending radially outwardly from said axis of rotation;

a plurality of flexible abrasive pads carried by said hub and extending from said planar face, each of said pads comprising a plurality of abrasive sheets of material and a key attached to said abrasive sheets, the key of each of said pads being inserted in a respective one of said keyways and extending through said slot whereby the abrasive sheets of each of said pads extend along a plane that is substantially perpendicular to said planar face and passes through said axis of rotation;

a releasable ring circumscribing said hub for constraining the key of each of said pads within said keyways, and

L-shaped biasing means disposed only on one side of each of said pads for biasing the abrasive sheets of each of said pads towards a position that is substantially perpendicular to said planar face to enable the abrasive sheets of each of said pads to be urged, in use, towards said surface with a substantially equal force, said biasing means comprising a flexible elastomeric spring extending substantially coextensively with said abrasive sheets, said spring having a short base portion and an arm portion extending proximate said abrasive sheets, said base portion being substantially perpendicular to said arm portion and mounted to said planar face,

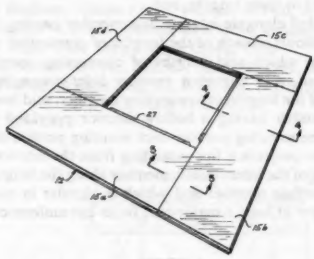
whereby during use of said tool, the abrasive sheets of each of said pads may be simultaneously biased into contact with said surface to form a smooth finish having substantially no striations.

4,493,171

MONOLITHIC CEILING MODULES AND CEILING SYSTEM

Leo G. Stahlhut, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 16, 1981, Ser. No. 244,228
Int. Cl.³ E04B *5/52*; F21V *21/02*
U.S. Cl. 52—28 **13 Claims**



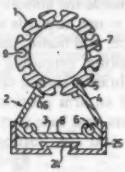
1. A ceiling module comprising

(a) ceiling-defining means for defining a rectangular ceiling area visible from below, and

(b) frame means, generally above said ceiling-defining means, for supporting said ceiling-defining means,

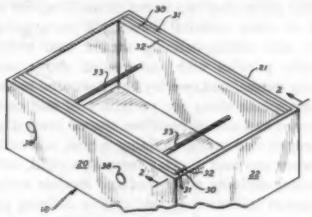
said ceiling module being characterized in that the major portion of said ceiling-defining means is a single sheet of material and in that said frame means comprise at least one panel of sheet material forming a rectangular overlay above said ceiling-defining means, said overlay being generally parallel with and spaced above said ceiling-defining means, said overlay being secured to said ceiling-defining means along the periphery of said ceiling-defining means and also at positions spaced inwardly from the peripery of said ceiling-defining means, said ceiling-defining means and said overlay forming a rigid, self-supporting ceiling-defining portion of said module without vertical support spines above said ceiling-defining portion for supporting said ceiling-defining portion wherein said frame means comprise four upper panels secured to each other to form said rectangular overlay, said upper panels also forming a central rectangular opening in said overlay, said overlay having a peripheral down-turned margin and a down-turned margin around said central opening, both said down-turned margins being secured to said ceiling-defining means.

4,493,172
CONNECTOR SYSTEM
Brian D. Jones, 6 Yorkton Rise, Mangere Bridge, Auckland, New Zealand
Filed Aug. 17, 1982, Ser. No. 408,899
Int. Cl.³ A47G 5/00
U.S. Cl. 52—220 8 Claims



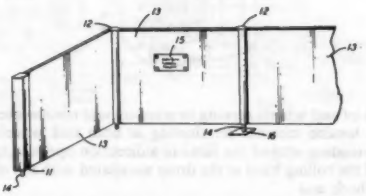
1. A combination of inter-connecting extruded members comprising:
short lengths of connecting members each having a hollow interior, a periphery which is substantially circular in cross-section and a plurality of integral connecting means formed on said periphery;
an engaging member having engaging means;
each connecting means comprising a locking groove running lengthwise along said connecting member, and each engaging means comprising a locking tongue running lengthwise along said engaging member, said groove and tongue inter-locking to prevent withdrawal except by sliding said members relative to each other in a direction parallel to their lengths; and
an extruded elongate intermediate member passing through the hollows of each of the lengths of connecting member and on which said lengths of connecting member are mounted, said engaging member inter-connecting with each of the lengths of connecting member, said intermediate member having a hollow interior provided with at least one securing portion, each securing portion comprising two projecting lips extending from the interior of the hollow of the intermediate member along the length of the intermediate member and which is circular in cross section over at least a major part of its circumference.

4,493,173
AUTOMATIC CABLE PASSAGE CLOSURE AND SEALING DEVICE
John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.
Filed Jan. 23, 1981, Ser. No. 227,799
Int. Cl.³ H02G 3/22
U.S. Cl. 52—221 33 Claims



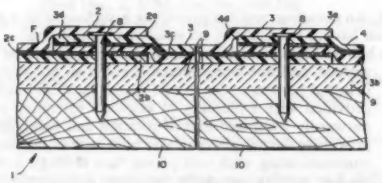
1. An automatic cable sealing device for positioning in a floor or other opening through which cables may be passed, to automatically protect and seal said cables therein on occurrence of excess heat or fire, said device comprising:
(a) a hollow casing, to be positioned in said opening,
(b) guide means in said casing,
(c) a first automatically sealing plate movably disposed on said guide means for movement of said plate therein, and
(d) a thermally activated expanding fire sealing coating on said plate,
whereby said sealing plate coating will automatically form and expand under pressure when exposed to fire or substantially highly elevated temperatures, automatically moving into position and flowing and closing said casing and closing onto and sealing said cables therein and sealing the floor or wall opening wherein the casing is positioned.

4,493,174
DISMOUNTABLE ROOM PARTITION
Robert A. Arens, Candia, N.H., assignor to Artafax Systems Limited, Inc., Manchester, N.H.
Filed Jun. 7, 1982, Ser. No. 385,681
Int. Cl.³ F04H 1/00
U.S. Cl. 52—243 17 Claims



1. A divider construction comprising a post and a panel mutually releasably engageable along elongated edges thereof;
said panel comprising a major surface having an elongated edge covered at least in part with a first hooked fiber fabric, and
said post comprising a rigid elongated core member comprising a hollow tube, said member firmly covered on its outer surface with a looped fiber fabric complementary to said hooked fiber fabric and mutually releasably engageable therewith, said looped fiber fabric comprising an elastic pile or felt fabric sleeve pulled over said core and firmly affixed to the ends of said core by means of the ends of said sleeve being turned into the ends of the core and secured with end plugs.

4,493,175
ROOFING SYSTEM
Joseph C. Coppola, Jr., Lincoln Park, N.J., assignor to Pantasote Inc., Greenwich, Conn.
Filed Sep. 24, 1982, Ser. No. 423,430
Int. Cl.³ E04D 1/26, 1/28
U.S. Cl. 52—410 8 Claims



1. A roofing system, comprising a roof; a plurality of prefabricated elongated roofing members on said roof, each said prefabricated member comprising an elongated strip having a three-ply laminate body portion comprising outer plies of a polymeric material and an inner ply of a reinforcing material and integral opposed, first and second longitudinally extending

edge portions, said first edge portion comprising a one-ply cover means comprising one of said outer plies of said polymeric material and a two-ply body means comprising the other of said outer plies of said polymeric material laminated to said reinforcing material, and said second edge portion comprising said three-ply laminate; said three-ply second edge portion of a said member being between said cover means and said two-ply body means of an adjacent said member, and means for fastening a said second edge portion of one member and its associated body means of an adjacent member to said roof.

4,493,176

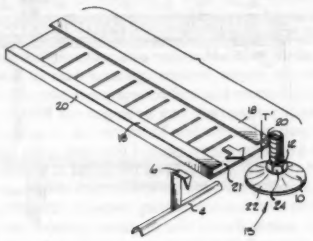
INSULATION MODULE MOUNTING MEANS

Anthony E. Cimochowski, Sedalia, Colo., assignor to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 040,616, May 21, 1979, abandoned. This application May 26, 1981, Ser. No. 266,856

Int. Cl.³ E04B *1/80*

U.S. Cl. 52—508 **5 Claims**



1. In an apparatus for securing a fibrous insulation module to a wall of a furnace or the like, said apparatus including: a support beam mounted internally of the insulation module; a C-shaped channel member adapted to be mounted extending along one face of said insulation module, said C-shaped channel member having edges (20) extending generally parallel to one another and lips (18) extending inwardly from said edges toward one another and being generally co-planar, the distance between said edges defining a first dimension 'W' and the thickness of said lips defining a second dimension T'; tab means extending between said support means and said channel member for securing said channel member to said insulation module; a rounded mounting member having a center portion thereof in contact with said furnace wall, said mounting member having a principal dimension 'D' which is less than said first dimension 'W'; securing means for attaching said mounting member to said furnace wall; whereby said securing means may affix said mounting member to said furnace wall and thereafter said C-shaped channel may receive the principal dimension 'D' of said rounded mounting member by sliding said channel thereover from any direction, thereby securing said insulation module to said furnace wall, the improvement comprising:

a spacer attached to said center portion of said mounting member, said spacer extending from said mounting member a predetermined distance T away from said C-shaped channel member, said predetermined distance T being greater than said dimension T'.

4,493,177

COMPOSITE, PRE-STRESSED STRUCTURAL MEMBER AND METHOD OF FORMING SAME

Stanley J. Grossman, 3200 Marshall Ave., Ste. 217, Norman, Okla. 73069

Filed Nov. 25, 1981, Ser. No. 324,980

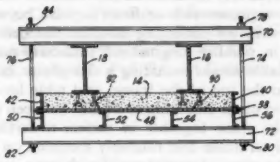
Int. Cl.³ E04C *3/26, 3/294*; B28B *9/04*

U.S. Cl. 52—745 **11 Claims**

1. A method of forming a composite, pre-stressed structural member of the type having an upper molded surface supported by a lower support member comprising:

connecting a lower support member to the upper side of a mold so that deflection of the mold causes deflection of the support member and such that support member connector means extend downwardly into said mold;

supporting the mold and lower support member so that deflection of the mold and lower support member can occur;



filling the mold with a moldable material which hardens to form a composite structural member with said lower support member; and

deflecting the mold during hardening of the moldable material such that the support memberr is placed in a stressed condition to form a composite, pre-stressed structural member upon hardening of the moldable material.

4,493,178

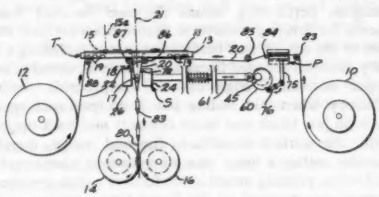
PACKAGING MACHINE

Leonard Buckner, Mount Eaton; William A. Foll, Sr., Wooster, and Stephen W. Pesho, Dalton, all of Ohio, assignors to Euclid Spiral Paper Tube Corp., Apple Creek, Ohio

Continuation of Ser. No. 242,365, Mar. 10, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,235

Int. Cl.³ B65B *9/02, 61/26*

U.S. Cl. 53—131 **1 Claim**



1. A compact manually portable packaging machine weighing less than fifty pounds for making a continuous ribbon of interconnected packets with each packet containing one or more articles to be dispensed comprising; a unitary one-piece open type frame having spaced front and rear walls connected by a minimal plurality of intermediate transverse ribs to form a lightweight single unitary compact small one-piece frame of open construction allowing maximum air circulation with all of the elements of the machine being mounted on the frame; a first roll of a strip of flexible packaging material rotatably mounted on one end of the frame; a second coacting roll of a strip of flexible packaging material rotatably mounted on the other end of the frame opposite said first roll; coacting guide means on said frame for guiding the two strips of packaging material from said rolls together through said frame in parallel longitudinal surface-to-surface registry, said guide means including a plurality of prepositioned rods, with certain of said rods having thereon coacting spaced sleeves that are longitudinally adjustable on the rods to guide the strips therebetween; heat sealing means operatively disposed on the frame for heat sealing all opposed margins of the two coacting strips of packaging material together with the article(s) therebetween to form an air-tight cavity containing said article(s), coacting

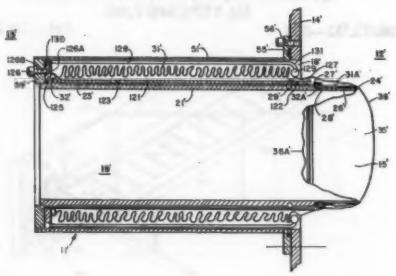
pull-down means for pulling said two strips of packaging material through said guide means in predetermined sequence, said pull-down means including a first pair of parallel spaced wheels rotatably mounted on the frame at a preselected point below said heat-sealing means, a second pair of parallel spaced wheels rotatably mounted on the frame opposite said first pair of wheels in coacting operative relation therewith, whereby said first and second pair of wheels coact to pull down on the heat-sealed longitudinal margins of the surface-to-surface disposed strips to pull the same through the machine; turntable means operatively mounted on the frame for feeding in predetermined sequence one or more articles between said two coacting strips of packaging material just before they come together in parallel longitudinal surface-to-surface registry, said turntable means including a flat planar horizontal table secured to the top of the frame, said table having a vertical open-ended chute emptying at a point between said strips just before they come together in surface-to-surface registry, a horizontal turntable disc rotatably mounted on said table for preselective circumferential rotation thereon, said disc having a plurality of spaced disc apertures formed adjacent to and around its circumferential periphery with each aperture registering with the chute as the disc is selectively rotated, whereby article(s) may be placed in said apertures and thereby fall down said chute one by one as the disc is preselectively rotated and thence fall between said strips and become heat-sealed therebetween by said heat-sealing means; said apertures of said disc being smaller than the chute, said heat-sealing means including a sealing back-up jaw block mounted on the frame at a point where said strips initially come together in surface-to-surface registry, said back-up jaw block having a heater element therein, a sealing jaw reciprocably mounted on the frame opposite said back-up jaw block for movement to and from the back-up jaw block and configured for preselected marginal contact therewith, said sealing jaw having a coacting heater element therein, said heater elements effecting predetermined temperatures in the back-up jaw block and in the sealing jaw, whereby when the sealing jaw is reciprocated against the back-up jaw block with the surface-to-surface disposed strips therebetween such strips are heat-sealed together around their margins; perforating means disposed on said heat-sealing means for forming transverse perforations on each transverse side of the cavity, said perforating means including a horizontally disposed serrated linear knife blade mounted adjacent the upper horizontal edge of said reciprocable sealing jaw, whereby when said sealing jaw is reciprocated against said back-up jaw block said blade contacts said back-up jaw block with the surface-to-surface disposed strips therebetween thereby cutting a linear row of serrations transversely across said strips; printing means in the form of a cam-operated stencil operatively mounted on the frame for imprinting a predetermined message on one of said strips before the two strips come together in parallel longitudinal surface-to-surface registry, said stencil including an inked stamp pad formed of very tight woven fibers effecting a dense porous ink pad to retain ink therein, said stamp pad containing a graphite added type ink of very high viscosity to effect maximum ink retention in the ink pad; and drive means for coactingly actuating said pull-down means, said turntable means, said heat seal means, said perforating means, and said printing means in predetermined coacting operative relationship to form a continuous ribbon of interconnected air-tight packets containing one or more articles to be dispensed, said drive means acting in coacting operative relationship with said one strip to cause said one strip to be stationary when said stencil is imprinting a message on such one strip, said chute being formed of anodized, hard-coated aluminum, the turntable disc being selectively rotated whereby of each of said disc apertures comes into complete registry with said chute at a point approximately sixty-two one thousandths of an inch in advance of the radial centerline of the chute to accommodate article(s) of certain configurations in passing effectively down the chute, said high viscosity ink being initially forced into the ink pad by means of vacuum and pressure, at least one of said strips being formed of clear thermoplastic material enabling visual inspection of the encased packaged article(s).

4,493,179

BAG-OUT MATERIAL HANDLING SYSTEM

Stephen B. Brak, Tinley Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1982, Ser. No. 352,749
Int. Cl.³ B65B *43/42*
U.S. Cl. 53—576 **8 Claims**



1. A bagging device for transferring material from a first chamber through an opening in a wall to a second chamber, said bagging device comprising:

an outer housing having open proximal and distal ends, said proximal end communicating with said opening;

an inner housing spaced concentrically within said outer housing so as to define an annular space therebetween, said inner housing having open proximal and distal ends so as to define a passage between said first and second chambers and wherein the circumference of the proximal end of said inner housing is smaller than the circumference of the remaining portion thereof;

means for sealably coupling the respective distal ends of said inner and outer housing in sealing said annular space at the distal portion thereof and wherein the proximal end portion of said annular space is open;

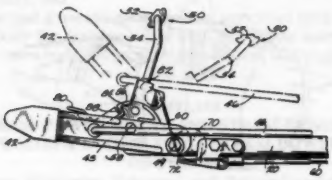
a rigid sleeve inserted in said annular space extending from the distal end to the proximal end of said inner housing and including seal means interposed between said sleeve and inner housing to seal and isolate the space therebetween from said second chamber; and

a pliable tube slidably engaged in sealed relationship with said sleeve and disposed thereon within said annular space, said pliable tube including a first closed end portion extending from the open proximal end portion of said annular space and over the proximal end of said inner housing in sealed relation thereto for receiving material from said first chamber through said inner housing, wherein the closed proximal portion of said tube is sealed and severed along said seal in providing a sealed container for handling said material while forming a second closed end portion extending over the proximal end of said inner housing ¹n maintaining isolation between said first and second chambers and wherein the smaller circumference of the proximal end of the inner housing facilitates the removal of the remnants of a used tube and the installation of a replacement tube with the remnants of the used tube discharged into the sealed, installed replacement tube.

4,493,180
LAWN MOWER DEAD MAN CONTROL

Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 30, 1982, Ser. No. 429,060
Int. Cl.³ A01D 69/00
U.S. Cl. 56—11.3 16 Claims

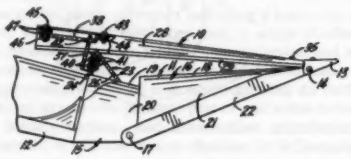


1. A lawn mower comprising a housing, a prime mover supported by said housing, a drive shaft driven by said prime mover, a cutter blade, clutch means driven by said drive shaft and engagable and disengagable with said cutter blade, a handle connected to said housing, control means movably attached to said handle about spaced first and second pivot axes, and linkage means for engaging and disengaging said clutch means in response to movement of said control means relative to said second pivot axis, said linkage means including a pulley rotatably attached to said handle and with said pulley having a periphery adjacent to said first pivot axis, and a longitudinally displaceable flexible member guided around said pulley and connecting said control means to said clutch means, whereby movement of said control means about said first pivot axis is ineffective to longitudinally displace said flexible member.

4,493,181
ATTACHMENT FOR THE SNOUTS OF COMBINES AND THE LIKE

George B. Glendenning, and Terry S. Glendenning, both of Davis Junction, Ill., assignors to Farmer's Factory Co., Lee, Ill.

Filed May 14, 1984, Ser. No. 609,589
Int. Cl.³ A01D 45/02
U.S. Cl. 56—314 7 Claims

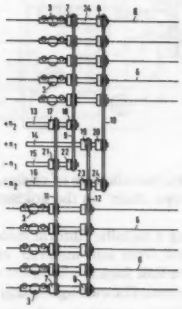


1. An attachment for the snout of a combine wherein the snout includes a forward portion having a pointed forward end and being hinged adjacent its rear to a rear portion fixed to the head of the combine and wherein the upper surfaces of said forward and rear portions are inclined upwardly and rearwardly at a predetermined angle from the front to the rear of the snout, said forward portion being adapted to swing up and down relative to said rear portion, said attachment having, in combination, a straight comparatively rigid member having a straight upper surface disposed above the upper surfaces of said forward and rear portions of said snout, said member extending rearwardly from said pointed forward end of said forward portion, means fastening the forward end of said member to said forward portion of said snout, said member being inclined upwardly and rearwardly at an angle greater than said predetermined angle whereby the spacing of the member above said snout increases progressively toward the rear of the snout, and slide means on said member and on said snout and supporting the rear of the member for sliding relative to said rear portion of the snout when said forward portion swings up and down.

4,493,182
DRIVING DEVICE FOR TWISTING HEADS OF AN SZ TWISTING MACHINE

Dieter Vogelsberg, Coburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,519
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3211260
Int. Cl.³ H01B 13/04
U.S. Cl. 57—293 12 Claims



1. A driving device for a twisting head of an SZ stranding machine for electrical or optical cables, by means of which the rotary motion of the twisting head is periodically changed in steps, the twisting head including first and second driving wheels rotatably supported on a rotatable hollow shaft; a twisting tool; first and second magnetic clutches, associated with the first and second driving wheels, with stators and rotors, and the rotors of said first and second magnetic clutches and said twisting tool firmly connected to the hollow shaft, comprising:

first means adapted to rotate at at least a first speed;

second means adapted to alternately rotate at at least second and third speeds;

means coupling said first means to said first driving wheel; and

means coupling said second means to said second driving wheel, whereby at least three motion states can be provided for predetermined time intervals.

7. A method of operating a driving device for a twisting head of an SZ stranding machine for electrical or optical cables, said twisting head having a hollow shaft; first and second driving wheels rotatably supported on said shaft; a twisting tool; first and second magnetic clutches one for each driving wheel each having a rotor, the rotors and said twisting tool firmly connected to said shaft, said driving device comprising: first drive means adapted to rotate at at least a first speed; second drive means adapted to rotate alternatingly at at least second and third speeds and means for coupling said first and second drive means to said first and second driving wheels respectively, comprising:

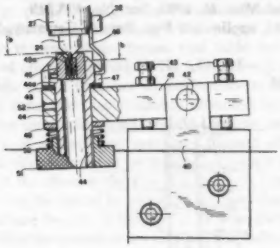
a. operating said second magnetic clutch to alternately rotate said twisting device at said second speed and third speed; and,

b. in between operating said second clutch to cause rotation at said second and third speeds, operating said first clutch to cause rotation at said first speed.

4,493,183
MACHINE FOR THE MANUFACTURE OF CHAINS, IN PARTICULAR OF THE TYPE KNOWN AS ROPE CHAIN IN THE GOLDSMITHERY INDUSTRY

Massimo Bucefari, Arezzo, and Giuseppe Scortecci, Castiglion Fibocchi, both of Italy, assignors to ICM S.p.A. Italiana Costruzioni Metalmeccaniche, Castiglion Fibocchi, Italy

Filed Sep. 23, 1982, Ser. No. 422,057
Claims priority, application Italy, Jan. 15, 1982, 9307 A/82
Int. Cl.³ B21L 7/00
U.S. Cl. 59—16 11 Claims



1. A machine for the manufacture of chains, in particular of the type known as "rope chain" in the goldsmithery industry, comprising:

(a) a unit for feeding a metallic filiform material and for the formation of a coil from said material, each turn of said coil constituting a link for the chain;

(b) a link separation unit for cutting off coil turns from said coil;

(c) a chain linking unit for connecting said link to the already formed chain;

(d) link take-up means alvernatively cooperating with said link separation unit for keeping the link and with said chain linking unit, said means being displaceable from a take-up position to a linking position and viceversa;

said links separation unit comprising at least a pair of blades operating like scissors on a cutting plane substantially tangent to the internal profile of said coil and perpendicular to the branch of coil turn to be cut, means being provided for adjusting the inclination of said cutting plane with respect to the horizontal plane; said chain linking unit comprising a calibrated passage for the chain having a decreasing section with minimum diameter meter at the outlet end of said passage substantially equal to the diameter of the chain to be produced, said chain being kept within said passage by the pressure of the links against the inner wall thereof; said link take-up means in said linking position being aligned with said chain linking unit for connecting the link to the already formed chain and being adapted to partially rotate about the alignment axis while simultaneously advancing toward said passage so as to force the chain to pass therethrough, thereby causing the progressive approach of the ends of the links until said links are completely closed.

4,493,184
PRESSURIZED NACELLE COMPARTMENT FOR ACTIVE CLEARANCE CONTROLLED GAS TURBINE ENGINES

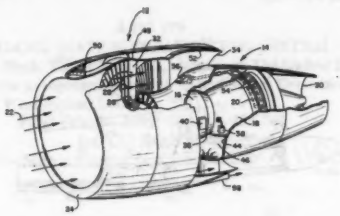
John P. Nikkanen, and James G. Griffin, both of West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 7, 1983, Ser. No. 472,917
Int. Cl.³ F02C 7/18
U.S. Cl. 60—204 4 Claims

1. A method of operating an aircraft power plant installed on an aircraft and of the active clearance controlled type including a gas turbine engine housed within a nacelle compartment and a cooling air manifold extending around the engine including the steps of:

admitting active clearance control cooling air into said nacelle compartment and discharging the air against the engine;

maintaining the air pressure within said nacelle compartment



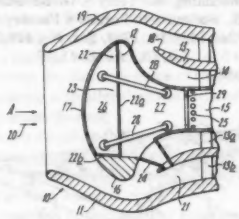
at altitude cruise conditions at a level which is on the order of one to two and one-half pounds per square inch (1–2½ psi) above the pressure of the air externally of the power plant;

discharging air from said compartment in an aft direction relative to the aircraft on which the power plant is installed.

4,493,185
GAS TURBINE ENGINE AIR INTAKE

John R. Hobbs, Amersham, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 225,110, Jan. 14, 1981, abandoned. This application Mar. 25, 1983, Ser. No. 478,787
Claims priority, application United Kingdom, Feb. 9, 1980, 8004401
Int. Cl.³ F04D 29/70
U.S. Cl. 60—39.092 6 Claims



1. A gas turbine engine air intake comprising:

a duct having a circular cross-section shape;

a centre body having a hollow interior and having a circular cross-section shape, said centre body having a first portion coaxially positioned upstream of said duct, said first portion having a part thereof of greater diameter than said duct, said centre body further having a second portion aligned with said first portion and extending coaxially within said duct and defining therewith an annular air inlet, said first portion and said second portion having spaced confronting edges;

a first drain means positioned on said first portion of said centre body and providing communication between the exterior and hollow interior of said centre body, said first drain means being defined by said confronting edges of said aligned portions of said centre body so that said first drain means provide the only interruption of the otherwise continuous exterior of said centre body, and being positioned to direct at least some of any liquid droplets impacting and subsequently flowing across the exterior of

said first portion of said centre body into the hollow interior of said centre body;

means to reduce the air pressure within the hollow interior of said centre body whereby the flow of liquid droplets through said drain means is enhanced, said means to reduce the air pressure within said centre body comprising a plurality of apertures in said centre body interconnecting said annular air inlet with the interior of said centre body; and

a second drain means operatively associated with said centre body for draining liquid from the hollow interior of said centre body to a location remote from said engine air inlet.

4,493,186

STEAM POWER PLANT AND STEAM GENERATOR, ESPECIALLY SUITED FOR A STEAM POWER PLANT OF THIS TYPE

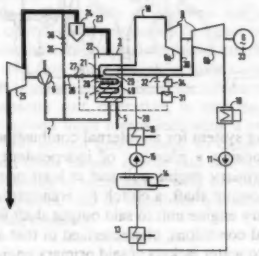
Werner Emsperger, Erlangen, and Reiner Engelhardt, Effeltrich, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,793

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132659

Int. Cl.³ F02C *6/04*

U.S. Cl. 60—39.182 **1 Claim**



1. Steam power plant, comprising:

a steam turbine having a high-pressure part and a low-pressure part;

a chargeable steam generator including a convection chamber, a waste gas discharge line, a single fluidized bed combustion chamber, a high-pressure heater, and an intermediate superheater having an inlet connected to said high-pressure part of said steam turbine, an outlet connected to said low-pressure part of said steam turbine, and a heating surface, said intermediate superheater being disposed in said convection chamber for influencing steam temperature at said outlet of said intermediate superheater;

a gas turbine connected in said waste gas discharge line downstream of said steam generator;

an air compressor connected to and driven by said gas turbine;

a combustion air supply line connected from said air compressor to said combustion chamber, said air supply line having a nozzle discharging into said convection chamber between said combustion chamber and said heating surface of said intermediate superheater, and said air supply line having an air valve for controlling air fed to said nozzle;

a regulator operatively connected to said air valve for controlling said air valve, a sensor being operatively connected to said regulator and disposed in vicinity of said outlet of said intermediate superheater for sensing the actual temperature of steam leaving said outlet, and a signal transmitter operatively connected to said regulator for giving said regulator a nominal value for the temperature of steam leaving said outlet, said regulator controlling said air valve causing the actual temperature to approach the nominal temperature at said outlet;

and a bypass line connected from said air supply line to said waste gas discharge line, said bypass line having another air control valve connected therein.

4,493,187

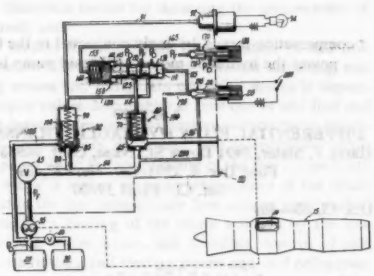
FUEL CONTROL

Kenneth P. Hansen, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,201

Int. Cl.³ F02C *9/26*

U.S. Cl. 60—39.281 **5 Claims**



1. In a fuel control for a gas turbine engine including a burner, fuel being supplied to said burner by a pump through a fluid pressure operated minimum pressure valve opened to allow fuel flow from said pump to said burner and closed to shut off said fuel flow, actuation of said minimum pressure valve being controlled by a sequence valve communicating with said minimum pressure valve by a fluid line, the improvement characterized by:

said sequence valve being connected to pump discharge pressure by a pump discharge line and including a moveable valve element, the position thereof controlling the pressure in said fluid line, thereby determining the actuation of said minimum pressure valve, and further including a fluid latch comprising a piston connected to said valve element and communicating with said pump discharge pressure at said sequence valve through a fluid passage, pressurization of said piston in a first direction by said fuel maintaining said sequence valve element in a latched condition for maintenance of said minimum pressure valve in an opened condition to sustain fuel flow from said pump to said burner.

4,493,188

DRIVE TRANSMISSION MEANS

Mervyn R. Marsh, 118 Star St., Carlisle W.A., Australia (6101)

PCT No. PCT/AU80/00107, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01729, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 10, 1980, Ser. No. 287,748

Claims priority, application Australia, Dec. 10, 1979, PE1673

Int. Cl.³ F16D *31/04*

U.S. Cl. 60—468 **7 Claims**

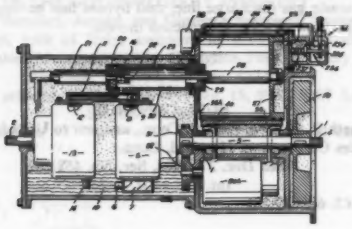
1. Drive transmission means for transmitting power from a prime-mover to a load, comprising:

a flywheel driven by the prime-mover,

a pump drivingly connected to the flywheel to place a hydraulic medium under pressure,

a hydraulic motor powered by said medium from the pump, means repetitively, and independently of the level of said

pressure, to unload the pump thereby permitting the prime-mover repetitively to accelerate the flywheel; and



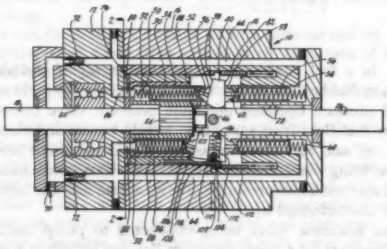
compensation means drivingly connected to the flywheel to power the hydraulic motor while said pump is unloaded.

4,493,189

DIFFERENTIAL FLOW HYDRAULIC TRANSMISSION

Harry F. Slater, 3491 Dover St., Napa, Calif. 94558

Filed Dec. 4, 1981, Ser. No. 327,409
Int. Cl.³ F16D *39/00*
U.S. Cl. 60—489 **12 Claims**



1. A hydraulic transmission comprising:

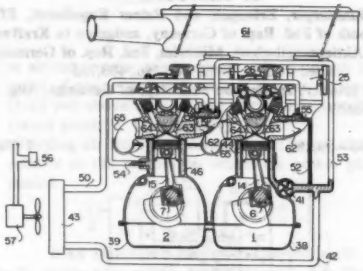
a fixed housing, an input shaft and output shaft journaled in the housing in coaxial alignment, a pump rotor in the housing secured to the input shaft, the rotor having a plurality of pump cylinders radially spaced around the axis of rotation of said shafts, the cylinders extending parallel to said axis of rotation, a pump piston in each pump cylinder movable in a direction parallel to said axis of rotation, the fixed housing having a plurality of stationary motor cylinders radially spaced around and extending parallel to said axis of rotation, a motor piston in each motor cylinder, a motor rotor pivotally connected to and rotating with the output shaft about the same axis of rotation as the output shaft and positioned axially between the pump cylinders and the motor cylinders, the motor rotor pivoting about a single axis extending perpendicular to said axis of rotation of the output shaft, the motor rotor having a pair of flat surfaces lying in respective planes extending at an acute angle to each other and parallel to said single pivot axis, means connected to each pump piston and motor piston slidably engaging the adjacent one of said flat surfaces, hydraulic means including a rotary valve member for fluid connecting a first group of pump cylinders to a first group of motor cylinders and a second group of pump cylinders to a second group of motor cylinders, rotation of the rotary valve switching the pump cylinders and motor cylinders successively from one of said groups to the other, and means rotatably coupling the rotary valve means to the output shaft, said means rotating the rotary valve means and the output shaft together as a unit.

4,493,190

COOLING SYSTEM FOR AN ENGINE HAVING A PLURALITY OF ENGINE UNITS

Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00296, § 371 Date Mar. 29, 1983, § 102(e) Date Mar. 29, 1983, PCT Pub. No. WO83/00528, PCT Pub. Date Feb. 17, 1983
PCT Filed Jul. 30, 1982, Ser. No. 483,954
Claims priority, application Japan, Jul. 31, 1981, 56-121182
Int. Cl.³ F02D *25/00*; F02B *73/00*
U.S. Cl. 60—714 **3 Claims**



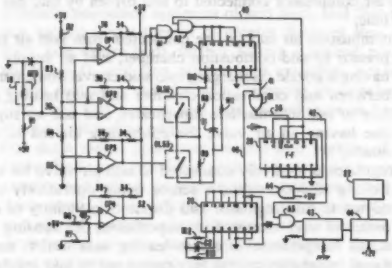
1. A cooling system for an internal combustion engine for a vehicle comprising a plurality of independent engine units including a primary engine unit and at least one auxiliary engine unit, an output shaft, a clutch for transmitting the output of said auxiliary engine unit to said output shaft in dependency on operational conditions, characterized in that a water pump is connected to water jackets of said primary engine unit, water jackets of said auxiliary engine unit are connected to water jackets of said primary engine unit in series, a radiator is connected to water jackets of said auxiliary engine unit in series, a bypass is provided to connect each water jacket to the water pump, means is provided to change the coolant circuit in dependency on the temperature of the coolant.

4,493,191

TRANSPORT REFRIGERATION SYSTEM WITH CONTROL FOR TOP FREEZING AVOIDANCE

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 14, 1984, Ser. No. 579,928
Int. Cl.³ F25B *49/00*; G05D *23/19*
U.S. Cl. 62—126 **4 Claims**



1. For a top freezing avoidance arrangement for a transport

refrigeration system in which air discharge temperature capable of causing top freezing of a fresh load are sensed and control the period of operation at a given refrigerating capacity in accordance with the level of temperature of the air discharged, a circuit arrangement for effecting said control comprising:

first voltage divider means including first temperature responsive resistance means sensing said discharge air temperature and second resistance means, said voltage divider means providing an analog signal in accordance with the sensed temperature;

a succession of comparators, each having one terminal connected to receive said analog signals;

second voltage divider means providing different reference signals to the other terminals of said comparators in accordance with preselected temperatures at which it is desired to change the digital output of said comparators from one state to another state;

first timer means including first oscillator means for generating first pulses at a rate dependent upon the state of the outputs from said comparators and first counter means connected to said first oscillator means to receive said pulses;

second timer means including second oscillator means for generating second pulses at a predetermined rate, and second counter means connected to said second oscillator means to receive saids second pulses;

flip-flop means including a clock input connected through gate means to the outputs of said first and second timer means an operative, in response to a signal from said first timer means indicating a predetermined count, to clear the count of said first timer means, actuate counting of said second timer means and to signal for a reduction in refrigerating capacity and, operative, in response to a signal from said second timer means indicating a predetermined count of said second timer means, to clear the count of said second timer means, enable said first timer means to resume counting in accordance with the output states of said comparators, and to signal for a restoration of said refrigerating capacity.

4,493,192

OPERATION DEVICE FOR ABSORPTION COLD AND WARM WATER SYSTEM UTILIZING SOLAR HEAT

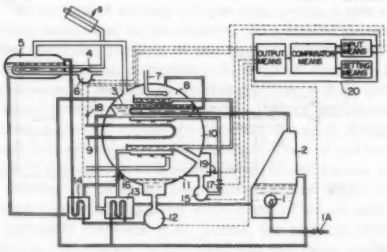
Yozo Hibino; Kohji Kamejima, both of Ibaraki, and Yasuaki Nara, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,503

Claims priority, application Japan, May 12, 1982, 57-78285

Int. Cl.³ F25B *15/00, 27/00*

U.S. Cl. 62—141 **9 Claims**



1. An operation device for an absorption cold and warm water system utilizing solar heat, with the system comprising a low temperature heat source generator using as a heating source low temperature warm water provided by heating water by the solar heat, a high temperature generator using an ancillary heat source as a heating source when the cold and warm water system becomes short of solar heat, a low temperature generator, and evaporator, and a condenser; the operation device comprising:

a low temperature warm water pump for introducing low temperature warm water into said low temperature heat source generator;

solution adjusting and feeding means for adjusting quantities of a concentrated solution fed to an absorber and of a dilute solution fed to said generators and feeding the adjusted quantities of solutions to said absorber and said generators, respectively;

refrigerant adjusting means for adjusting a quantity of refrigerant which is caused to circulate in the evaporator; and

a first detection means for detecting the temperature of cold and warm water outputted from said cold and warm water system;

a second detection means for detecting the temperature of refrigerant; and

a control section for controlling the operation of said low temperature warm water pump, solution adjusting and feeding means and refrigerant adjusting means in dependence upon values detected by at least one of said first and second detection means, said control section being operative to continuously drive said low temperature warm water pump when the temperature of the low temperature warm water is higher than the temperature of the dilute solution in the low temperature heat source generator so as to enable a heating of the dilute solution by the low temperature warm water, and to effect control of said solution adjusting and feeding means and said refrigerant adjusting means, so as to prevent the temperatures of the cold and warm water, refrigerant and solution from exceeding predetermined levels in the process of controlling the temperatures of the cold and warm water fed to a load to a desired value through heating by the low temperature warm water, upon insufficient heating by the low temperature warm water, to cause a heating by the ancillary heat source.

4,493,193

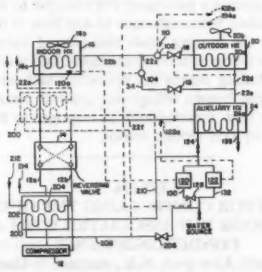
REVERSIBLE CYCLE HEATING AND COOLING SYSTEM

Ralph H. Fisher, Newport News, Va., assignor to Rutherford C. Lake, Jr. and John E. Duberg, both of Newport News, Va., part interest to each

Continuation-in-part of Ser. No. 355,123, Mar. 5, 1982, Pat. No. 4,409,796. This application Oct. 17, 1983, Ser. No. 542,375

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—160 **9 Claims**



1. A reversible mode heating and cooling system for heating and cooling an interior space, comprising:

(a) compressor means for compressing vaporous refrigerant;

(b) indoor heat exchange means arranged in heat exchange relationship with air in said interior space for condensing refrigerant and heating said air during the heating mode

and evaporating refrigerant and cooling said air during the cooling mode;

(c) refrigerant expansion means;

(d) outdoor heat exchange means arranged in heat exchange relationship with outdoor ambient air for evaporating refrigerant during the heating mode and condensing refrigerant during the cooling mode;

(e) refrigerant flow reversing means for providing mode means heating and cooling from the system by refrigerant flow direction selection;

(f) auxiliary heat exchange means for evaporating refrigerant during the heating mode, said auxiliary heat exchange means arranged in a series flow relationship with said outdoor heat exchange means and downstream thereof during the heating mode;

(g) refrigerant conduit means connecting said compressor means, indoor heat exchange means, refrigerant expansion means, outdoor heat exchange means, auxiliary heat exchange means and refrigerant flow reversing means in a series flow relationship to form a reversible heating and cooling system for transferring heat via a fluid refrigerant between said indoor heat exchange means and said outdoor and auxiliary heat exchange means;

(h) bypass refrigerant conduit means connected in a parallel flow relationship with said outdoor heat exchange means and in a series flow relationship with said auxiliary heat exchange means for selectively bypassing said outdoor heat exchange means and directing at least a part of said refrigerant flow through said auxiliary heat exchange means in parallel flow relationship with refrigerant flow through said outdoor heat exchange means;

(i) storage means for storing a heat exchange fluid;

(j) connecting means connecting said storage means and said auxiliary heat exchange means for circulating a heat exchange fluid and exchanging heat between said storage means and said auxiliary heat exchange means, said connecting means including reclamation heat exchange means for transferring heat between said refrigerant and said heat exchange fluid;

(k) first control means for controlling the extent of heat exchange fluid flow from said storage means to said auxiliary heat exchange means, said first control means including a first sensor disposed for sensing a system parameter during the heating mode and first valve means in said connecting means, said first control means including means for adjustably operating said first valve means in said connecting means to allow heat exchange fluid flow therethrough in response to the parameter sensed by said first sensor; and

(l) second control means for selectively allowing the flow of refrigerant through said bypass refrigerant conduit means, said second control means including a second sensor disposed for sensing a parameter correlatable to the capacity of said outdoor heat exchanger to add heat to the refrigerant during the heating mode and second valve means in said bypass refrigerant conduit means; said second control means including means for operating said second valve means in said bypass refrigerant conduit means to allow refrigerant flow therethrough in response to the parameter sensed by said second sensor.

4,493,194

APPARATUS FOR CONTROLLING THE OPERATION OF AN INDOOR FAN ASSOCIATED WITH AN AIR CONDITIONING UNIT

Mario F. Briccetti, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 362,789, Mar. 29, 1982, Pat. No. 4,449,375. This application Nov. 21, 1983, Ser. No. 553,619

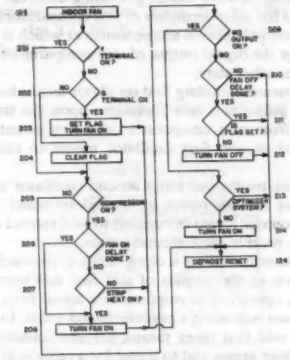
Int. Cl.³ F25D *17/06*

U.S. Cl. 62—180 **8 Claims**

1. Apparatus for controlling the operation of an air conditioning system having a refrigeration circuit with a compressor, a microprocessor based control, a thermostat for sensing a need for heating or cooling including means for selectively operating an indoor fan continuously without regard to operation of the refrigeration circuit, said thermostat supplying a first signal to the microprocessor based control when fan operation is desired and a second signal to the microprocessor based control when compressor operation is desired which comprises:

means for energizing the indoor fan in response to the first signal from the thermostat;

means for energizing the compressor in response to the second signal from the thermostat;



means for setting an indicator when the first signal is sensed and the second signal is not sensed;

means for sensing if the thermostat is supplying a second signal and the compressor is not operating;

means for detecting if the indicator is set; and

means for operating the fan continuously if the means for sensing determines the compressor is not operating and the thermostat is supplying a second signal and the means for detecting determines that the indicator is set.

4,493,195

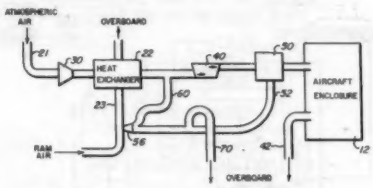
AIR CONDITIONING SYSTEM WITH EVAPORATIVE COOLING APPARATUS

Philip F. Zalesak, Waldorf, and Ronald D. Moore, Lusby, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1983, Ser. No. 493,461

Int. Cl.³ F25D *9/00*

U.S. Cl. 62—402 **5 Claims**



1. An air-cycle, air conditioning system for an enclosure having a compressor arranged to sequentially pass compressed air through a heat exchanger for partially cooling the compressed air and then to an expansion cooling turbine for decompressing and further cooling the same for discharge into the enclosure; wherein the improvement comprises:

a condensate extractor interposed downstream of said expansion cooling turbine and disposed above said heat

exchanger to provide gravity actuation of extracted condensate;

a nozzle disposed beneath the condensate extractor to receive the condensate and direct it to impinge upon said heat exchanger thereby providing auxiliary evaporative cooling;

a water conduit connecting said nozzle to said condensate extractor for transporting the condensate therethrough; and

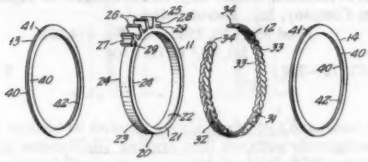
an air conduit through which said nozzle communicates with said compressor to receive compressed air for dispersing the condensate.

4,493,196

RING CONSTRUCTION AND METHOD OF MAKING SAME

Max Bogner, 291 Henry St., Paramus, N.J. 07652, and Larry Grun, 64 Cricket Dr., Roslyn, N.Y. 11576

Filed Sep. 15, 1983, Ser. No. 532,551
Int. Cl.³ A44C *9/00*
U.S. Cl. 63—15 **4 Claims**



1. An improved ring construction comprising: a base element including a continuous annular member and an integral gem stone mounting on an outer surface of said annular member, said gem stone mounting forming a pair of oppositely disposed lip members forming recesses between said lip members and said outer surface of said annular member; an elongate decorative strip of metallic material mounted upon an outer surface of said annular member and having first and second ends respetively positioned beneath one of said lip members within one of said recesses; and a pair of outer planar ring members of larger diameter corresponding to the effective diameter of said braided material and overlying the longitudinal edges thereof, said ring members being interconnected to lateral edges of said annular member; whereby only an outer planar surface of said decorative strip is exposed to view.

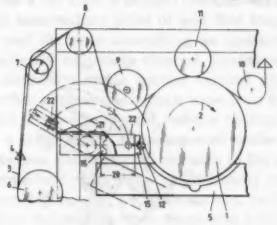
3. The method of making a finger ring having a gem stone mounting on an outer surface thereof, and a braided decorative member overlying portions of said ring on either side of said gem stone mounting, comprising the steps of: casting a main body element to include an annular member and an integral gem stone mounting on an outer surface thereof, said mounting including a pair of oppositely disposed lips each defining a channel formed between an undersurface of one of said lips and a respective portion of said outer surface of said annular member; forming an elongated decorative strip of width corresponding to that of said outer surface and of length such that the oppositely disposed ends thereof are seatable within a respective said channel when overlying said outer surface of said annular member; soldering said decorative strip in position upon said outer surface with said ends disposed within said channels; providing a pair of planar ring members of larger diameter corresponding to the outer diameter of said decorative strip, and an inner diameter corresponding to that of the inner diameter of said annular member; and soldering said planar ring members to said annular member to overlie the longitudinal edges of said strip.

4,493,197

FOULARD MACHINE

Hans E. Meller, Königsberger Str. 7a, D-8676 Schwarzenbach, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,462
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216726
Int. Cl.³ D06B *1/14*
U.S. Cl. 68—202 **11 Claims**



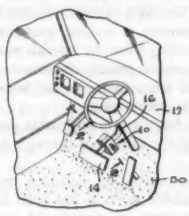
1. A foulard machine for applying liquor to a web of textile material comprising an enlacing roller coated with an elastic material; a trough for accommodating a liquor which is taken up out of said trough and applied to a web by the enlacing roller; a magnetic wiper which abuts against the circumference of the enlacing roller and wipes off any excess liquor, said wiper having on its contact surface abutting against the enlacing roller a plurality of adjacent recesses or indents and being held in abutment against the circumference of the enlacing roller over its entire length by means of magnetic forces; and a magnetic bar disposed parallel to said wiper on the side facing away from the enlacing roller; the wiper being pressed against the circumference of the enlacing roller; the wiper being spaced from the magnetic bar and pressed against said roller by forces of magnetic repulsion with the aid of the magnetic bar; the spacing between the magnetic wiper and the magnetic bar being infinitely adjustable.

4,493,198

ANTI-THEFT LOCK FOR PEDAL OPERATED APPARATUS

William B. Brown, 18700 Covello St., Reseda, Calif. 91335

Filed Sep. 3, 1982, Ser. No. 414,895
Int. Cl.³ F16H *57/00*
U.S. Cl. 70—203 **5 Claims**



1. An anti-theft lock for pedal-operated apparatus having a pedal lever, said lock comprising:

first and second adjacent stop bodies, one of said stop bodies having a recess for receiving the pedal lever and the other of said stop bodies having a face thereon for abutment against an adjacent portion of the apparatus to limit actuation of the pedal lever to inhibit operation of the apparatus; and

locking means including a lock body having a shackle embracing the pedal lever and engaging both said first and

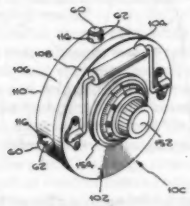
second stop bodies to hold together said stop bodies to hold the pedal lever therebetween.

4,493,199

UNIVERSAL BOLTWORKS MECHANISM FOR SAFE DOOR

Tim Uyeda, South San Gabriel, Calif., assignor to La Gard, Inc., Torrance, Calif.

Filed Sep. 21, 1982, Ser. No. 420,712
Int. Cl.³ E05B *15/16, 63/00*
U.S. Cl. 70—333 R **16 Claims**



1. A universal boltworks mechanism for use with a safe having a safe door mounted to a safe enclosure, said enclosure having a door frame, said safe door carrying a lock mechanism and multiple outwardly extending bolts for selectively engaging the door frame thereby locking the safe, said lock mechanism including a driving apparatus which rotates from a position associated with the safe being locked to a position associated with the safe being unlocked only in response to a preselected unlocking manipulation of said lock mechanism, the improved mechanism comprising a universal cam means driven by said lock mechanism driving apparatus for driving said multiple outwardly extending bolts to disengage the door frame in response to rotation of the driving apparatus to the unlocked position, said universal cam means being alternatively usable with safe doors of circular and quadrilateral configuration and comprising:

a cam member having a set of first multiple bolt driving portions on a first side thereof for use when said cam member is used in conjunction with a circular safe door and a set of second multiple bolt driving portions on a second side thereof for use when said cam member is used in conjunction with a quadrilateral safe door.

15. A universal boltworks mechanism for use with any dimension of circular safe door within a predetermined range of dimensions and, alternatively, for use with any dimension of rectangular safe door within a predetermined range of dimensions, said safe door having a centrally located interior bore of a predetermined diameter, a coaxial aperture of a predetermined diameter extending from the interior bore to the exterior surface, and multiple equiangularly displaced apertures extending radially outward from said interior bore, said universal boltworks mechanism comprising:

a lock mechanism having a manipulable portion accessable to the exterior of the safe door through said coaxial aperture;

cam driving means rotated by said lock mechanism whenever the manipulable portion has been manipulated in a predetermined manner associated with unlocking the safe;

multiple bolts each slidably mounted in one of said radial apertures for limited movement radially inward and outwardly with respect to the safe door and having a length corresponding to the dimension of the safe door such that said limited movement selectively engages the safe door frame thereby locking and unlocking the door, the radially inward portion of each bolt being provided with a bolt-associated pin;

a universal cam member integral with said cam driving means and having a lock mechanism protective fence portion extending circumferentially about the lock mechanism adjacent to and radially inward of said interior born, three equiangularly displaced inwardly spiraling grooves proximate the periphery of one side of the universal cam member for engaging three bolt-associated pins and thereby driving three bolts mounted equiangularly on a circular safe door, and four equiangularly displaced bolt driving apertures proximate the periphery of the other side of the universal cam member, each for engaging a pivot pin portion of a bolt driving link pivotedly mounted to a respective bolt and thereby driving four bolts mounted equiangularly on a square safe door; and

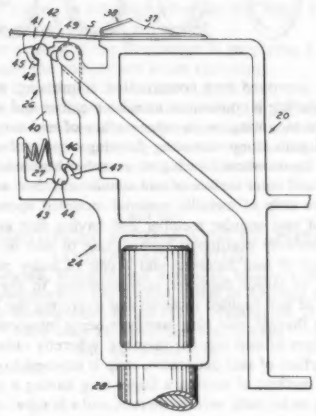
a cover plate for enclosing said boltworks mechanism within said interior bore and having break-away means for breaking away a portion of the cover plate whenever forces in excess of a predetermined threshold amount are experienced by any portion of the universal boltworks mechanism, said breaking away causing partial disassembly of the boltworks mechanism in a predetermined manner whereby the boltworks mechanism is substantially disabled in a door locked condition whenever the boltworks mechanism is drilled into, hammered upon, or blasted as in during an attempted theft of the safe contents.

4,493,200

PORTABLE SHEET BENDING BRAKE

James J. Rhoades, Garden City, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.

Filed Mar. 10, 1983, Ser. No. 474,206
Int. Cl.³ B21D *5/04*
U.S. Cl. 72—319 **7 Claims**



1. A portable sheet bending brake comprising

a fixed member defining a clamping surface extending longitudinally,

a second bending member extending longitudinally,

means hinging said bending member to said fixed member,

an anvil member extending longitudinally of said sheet bending brake,

means for moving a said anvil member into and out of clamping position with said fixed member so that a workpiece can be clamped between said anvil and fixed member,

a floating compensator comprising a compensator member pivoted solely to the bending member and a workpiece engaging pad pivoted solely to the compensator member and comprising the sole contact with the surface of the workpiece such that as the bending member is swung to bend a workpiece, the pad engages the surface of the workpiece and remains in contact with the workpiece at

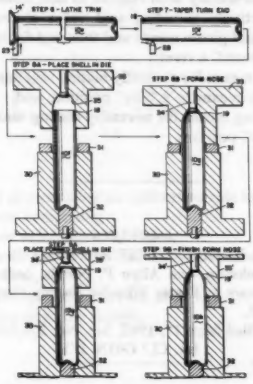
the same area by the relative pivotal action of the bending member, the compensator member and the pad.

4,493,201

METHOD OF MAKING A METAL BOTTLE FOR EXOTIC GASES UNDER PRESSURE

Donald J. Schmidt, DuBois, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.

Filed Jan. 21, 1983, Ser. No. 459,780
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **18 Claims**



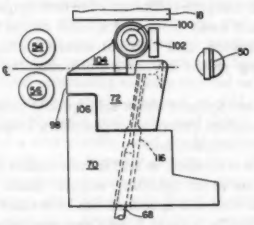
1. A method of forming a strong seamless one-piece metal bottle of substantially uniform wall thickness throughout for containing and dispensing gas under pressure which comprises: first forming a metal shell having a closed bottom end wall and a forwardly extending cylindrical side wall of substantially uniform wall thickness therealong that terminates in an open-end portion that substantially corresponds in diameter to the inner diameter of the cylindrical side wall, tapering the wall thickness of an adjacent portion from the main body of the side wall by reducing its thickness towards its open-end portion, and therafter turning-in and rounding the adjacent portion into a nose portion defining an open-end mouth of reduced diameter for receiving a ferrule or the like therein and in such a manner as to provide the nose portion with a wall of substantially uniform thickness along its extent that substantially corresponds to the thickness of the main body of the cylindrical side wall.

4,493,202

RAILROAD SPIKE FORGING MACHINE

Richard J. Stafford, Charlotte, N.C., assignor to Stafford Rail Products, Inc., Lancaster, S.C.

Filed Sep. 24, 1982, Ser. No. 422,811
Int. Cl.³ B21G *3/12, 3/16;* B21K *1/72*
U.S. Cl. 72—353 **6 Claims**



1. In a railroad spike forging machine of the type comprising a steel stock pointing roller assembly which longitudinally feeds pointed spike blanks along a centerline to a head forming station, where a gripper arm holds the blank in a main die as a heading die contacts and expands an unsupported leading edge of the spike blank against a recess in the leading edge of the main die, thereby to shape a spike head, the improvement which comprises;

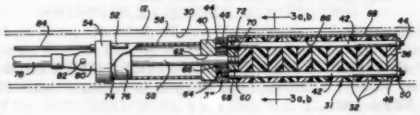
a main die of hardened tool steel having a first vertical dimension, a first transverse dimension and a first longitudinal dimension between its leading edge and a trailing edge, wherein a die zone is defined between said leading edge and an intermediate point of said first longitudinal dimension, said die zone comprising an upwardly open and longitudinally extending channel, having a second transverse dimension and a second vertical dimension, wherein further a transversely open wipe zone is defined between said intermediate point and the trailing edge of the die by a transversely extending wall surface which further comprises a symmetrical entrance to the die zone, at said intermediate point and a longitudinally and transversely extending channel entrance surface, said die surfaces together defining an open transverse relief for the channel, whereby a transverse wiping of the channel is enabled across said entire wipe zone of the die.

4,493,203

RESILIENT INTERNAL MANDREL

Lionel H. Wheeler, Houston, Tex.; Robert G. Goekler, Owasso, and Daniel G. Luddeke, Tulsa, both of Okla., assignors to Crutcher Resources Corporation, Houston, Tex.

Filed Jan. 26, 1983, Ser. No. 461,172
Int. Cl.³ B21D *9/01*
U.S. Cl. 72—369 **24 Claims**



1. An internal mandrel for use with a pipe bender to bend a pipe, comprising:

a first end structure;

a deformable resilient material having a first face and a second face positioned on one side of the first end structure with the first face abutting the first end structure;

deformation means having a first portion and a second portion, said second portion abutting the second face of the deformable resilient material, said deformation means for moving said second portion relative to said first portion; and

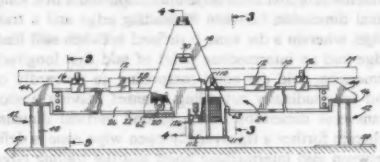
connector means forming a connector that is rigid in a direction parallel the length of the pipe, said rigid connector for extending between the first end structure and the first portion of the deformation means for supporting the first end structure and deformation means so that when the second portion moves relative to the first portion toward the second face of the deformable resilient material, the deformable resilient material is deformed between the second portion of the deformation means and the first end structure to expand the deformable resilient material to support the internal walls of the pipe proximate the bend.

4,493,204

SHAFT STRAIGHTENING PRESS WITH A TRAVELING RAM

Richard C. Merrel, Lakewood, Calif., assignor to Step Enterprises, El Toro, Calif.

Filed Jan. 21, 1983, Ser. No. 459,828
Int. Cl.³ B21D 9/05
U.S. Cl. 72—389 12 Claims



1. An improvement in a shaft straightening press, including a bed, a pair of V-blocks slidably engaging said bed and for supporting a shaft placed on said V-blocks, a pair of precision roller blocks slidably engaging said bed, said precision roller blocks selectably adjustable in a vertical direction with respect to said bed, a movable carriage slidably mounted on said bed and disposed between each one of said pair of precision roller blocks and said pair of V-blocks, said movable carriage including a ram for selectively contacting and exerting a force on said shaft to be straightened, said improvement comprising:

first means connected to said movable carriage for slidably and freely translating said carriage in a generally horizontal direction on said bed so that said movable carriage and ram can be selectively positioned with respect to said shaft disposed in a fixed position on said bed; and

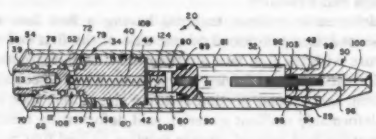
elevating means mounted on said carriage and operable to shift said carriage between a lowered position rendering said first means operable and an elevated position disabling said first means whereby said elevating means may be actuated to lower said carriage to render said first means operable so said carriage may be freely translated to move said ram to a selected position relative to said V-blocks, said elevating means then actuated to elevate said carriage to disable said first means to hold said carriage stationary relative to said bed.

4,493,205

PNEUMATICALLY DRIVEN RIVET INSERT TOOL

Carl Ramey, Yellville, Ark., assignor to Micro Plastics Inc., Flippin, Ark.

Filed Sep. 29, 1982, Ser. No. 427,173
Int. Cl.³ B21D 31/00
U.S. Cl. 72—391 3 Claims



1. A pneumatic expansion rivet applicator tool comprising:

rigid, elongated, generally cylindrical body means adapted to be manually grasped by a workman, said body means having first and second internal cavities;

pneumatic coupling means associated with said body means for supplying air pressure to said first cavity;

fitting means associated with said body means for receiving the shank of an expansion rivet to be installed by said tool;

fluid flow passageway means interconnecting said first and second cavities;

valve means disposed interiorly of said body means for normally blocking and selectively unblocking said fluid flow passageway means thereby permitting gas to flow from said first cavity to pressurize said second cavity;

firing pin means for slidably, forcibly, contacting said expansion rivet shank when activated to install said rivet;

piston means for actuating said firing pin means in response to pressurization of said second cavity;

said body means including a substantially cylindrical main body portion and a manually actuable, tubular handle portion coaxially fitted to said main body portion and selectively axially displaceable with respect thereto, said handle portion operable as a trigger means when moved axially forwardly with respect to said main body portion for selectively actuating said valve means whereby to actuate said piston means and thus said firing pin means to thereby install a rivet;

first spring means for normally biasing said handle portion of said body means to a "fire" position; and,

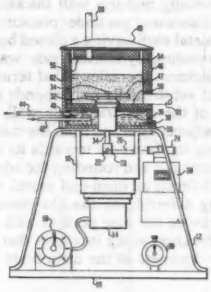
second spring means for normally biasing said piston means to a "fire" position.

4,493,206

EROSION TEST APPARATUS

Richard C. Johnson, and Allyn P. Norris, both of Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed May 17, 1982, Ser. No. 378,537
Int. Cl.³ G01N 3/56
U.S. Cl. 73—7 35 Claims



1. Test apparatus for testing the erosion resistance of a specimen comprising:

an enclosure encompassing a test chamber;

an abrasive medium disposed in said enclosure;

spindle means attached to said enclosure, said spindle means having an inside end adapted to hold said specimen, said spindle means including: a shaft and thermal means for moderating temperature within said spindle means and sized to dissipate sufficiently the heat originating from said enclosure away from said spindle means to avoid distortions thereof, said thermal means including a heat exchanging jacket having a fluid chamber encircling said shaft;

cover means secured about said spindle means for shielding said specimen except at its periphery from erosion by said abrasive medium; and

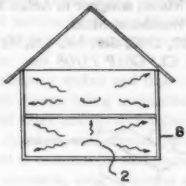
motor means coupled to said spindle means for spinning said inside end at an adjustable angular speed within said medium, so that said specimen can be eroded at its periphery with a uniform particle impingement speed and with no substantial erosion occurring at radially inward locations shielded by said cover means.

4,493,207

METHOD AND APPARATUS FOR MEASURING THE RATE AT WHICH AIR INFILTRATES INTO AND OUT OF BUILDINGS

John C. Dempsey, Elliottville, N.Y., assignor to Taggents, Inc., Kensington, Md.

Filed Jan. 19, 1982, Ser. No. 340,620
Int. Cl.³ G01M 3/20
U.S. Cl. 73—40.7 26 Claims



1. A method of measuring air infiltration rate into and out of an enclosed area comprising

placing tracer substance in the area,

emitting tracer gas at a substantially constant rate over a period of time,

sampling gaseous content of the area, and

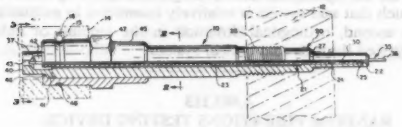
measuring tracer in the sample.

4,493,208

DUAL ENGINE PROBE

Donald D. Grover, Kenosha, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Dec. 29, 1982, Ser. No. 454,434
Int. Cl.³ G01M 15/00
U.S. Cl. 73—117.3 7 Claims



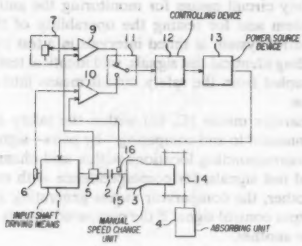
1. A probe for accessing timing event signals in an internal combustion engine including a selected cylinder which has a threaded opening, said probe being adapted to be inserted into the threaded opening, said probe comprising an elongated body including a bore extending therethrough and including front and rear ends, said bore having a reduced diameter portion adjacent to said front end, said elongated body including a shoulder at the rear end of said reduced diameter portion, a tube composed of light-transmitting material having a first end abutting said shoulder and having a second end protruding slightly beyond said rear end, a microwave conductor in said tube having a first end protruding from said front end and having a second end protruding slightly beyond said rear end, a tubular non-conductive shield disposed at said rear end in end-to-end relationship with said body, said shield including a front portion and a rear portion, said shield including in said front portion a cavity of a diameter greater than the diameter of said tube and receiving therein the second ends of said tube and said microwave conductor, said shield including in said rear portion a port of a diameter slightly greater than the diameter of said microwave conductor, and a sleeve encompassing portions of said shield and said body.

4,493,209

CONTROL SYSTEM IN A TEST DEVICE FOR TESTING A MANUAL SPEED CHANGE UNIT

Hiroshi Takeshita, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,171
Claims priority, application Japan, May 11, 1982, 57-80476
Int. Cl.³ G01M 17/00, 13/02
U.S. Cl. 73—118 2 Claims



1. A control system for a test device for testing a vehicular manual speed change unit having an input shaft, comprising:

an input shaft driving means for forcibly driving said input shaft of said manual speed change unit;

a clutch located between said input shaft driving means and said input shaft;

detector means for detecting the revolution speed of said input shaft and outputting data indicating the change of speed of said manual speed change unit during the disconnection of said clutch; and

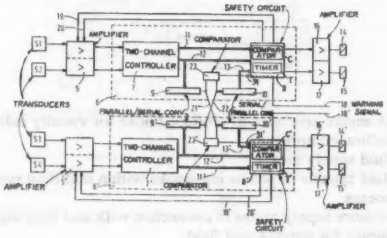
control means responsive to the output of said detector means for controlling the revolution speed of said input shaft driving means in order to provide a synchronization between the revolution speed of said input shaft and the revolution speed of said input shaft driving means when said clutch is in said disconnected connected state.

4,493,210

ANTI-BLOCK CONTROL SYSTEM TEST

Herbert Fries, Oberthal; Jürgen Gerstenmaier, Neckargmünd; Stefan Kircher, Ludwigsburg, and Jürgen Koch-Dücker, Edingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE82/00131, § 371 Date Feb. 22, 1983, § 102(e) Date Feb. 22, 1983, PCT Pub. No. WO83/00124, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 22, 1982, Ser. No. 474,574
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126102
Int. Cl.³ G01L 5/28
U.S. Cl. 73—121 10 Claims



1. Anti-wheel block control system for separately monitoring the wheels of a vehicle having

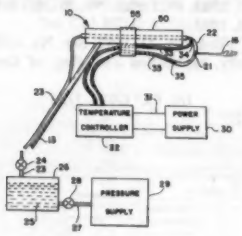
four identical control channels,
each control channel including
a sensor (S1, S2, S3, S4) sensing wheel behavior,
an evaluation circuit (6, 6') evaluating the output signals from the associated sensor,
and a brake control unit (16, 14; 17, 15; 16', 14'; 17', 15') coupled to and being controlled by the respective evaluation circuit,
one channel, each, being associated with a wheel brake of the vehicle;
a safety circuit means for monitoring the anti-wheel block system and for testing the operability of the anti-block control system at timed intervals in a test cycle and providing identical test signals, said identical test signals being coupled from the safety circuit means into all the channels;
comparator means (C, C') within the safety circuit means connected to and comparing—by pairs—signals occurring at corresponding locations within said channels based on said test signals, for correspondence with respect to one another, the comparator means generating a malfunction output control signal if the compared signals deviate from one another,
wherein, in accordance with the invention,
the safety circuit means comprises
separate safety circuits (8, 8') for each pair of channels including timing means for monitoring the temporal response time of the respective channels; and
means for testing the operability of both safety circuit means and connected to both pairs of channels including
at least one further comparator (23, 23'), being connected to the safety circuits (8, 8') for comparing, during the test cycle, agreement of the test signals separately generated for each channel pair,
said at least one further comparator (23, 23') generating a malfunction output signal if the test signals differ from one another.

4,493,211

CONTINUOUS LAMINAR SMOKE GENERATOR

Leonard M. Weinstein, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 30, 1983, Ser. No. 527,918
Int. Cl.³ G01M 9/00
U.S. Cl. 73—147 **11 Claims**



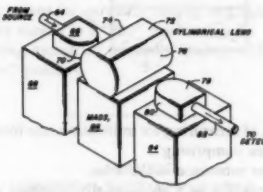
1. A smoke generator to produce smoke for visually indicating airflow comprising:
a fluid supply means;
a fluid capable of producing smoke within said fluid supply means;
a pressure supply means in connection with said fluid supply means for moving said fluid;
a feed tube means having a wall and a closed end, said feed tube means in fluid connection with said fluid supply means;
heating means for directly heating at least a portion of said feed tube; and
a smoke exit hole located in the wall of said directly heated portion of said feed tube such that the circumference of said exit hole does not coincide with the closed end of said feed tube.

4,493,212

FIBER OPTIC MASS SENSOR

Arthur R. Nelson, Stow, Mass., assignor to Aetna Telecommunications Laboratories, Westboro, Mass.

Filed Sep. 20, 1982, Ser. No. 420,361
Int. Cl.³ G01P 15/08
U.S. Cl. 73—517 R **8 Claims**



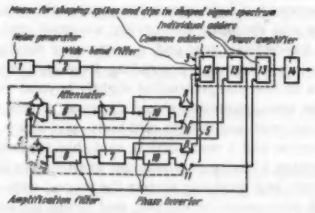
1. A system for sensing a parameter comprising:
a optical system having means for focusing light, said focusing means being positionally responsive to an environmental parameter;
means for applying light through said optical system with the light exiting said optical system varying in intensity in response to the position of the light focusing means of said optical system; and
means for detecting the amplitude of the light exiting from said optical system to provide an output indication of position of said optical system, said optical system having a focusing characteristic which controls the sensitivity of said system to said parameter, said focusing means including means for limiting the motion thereof such that said focusing means is sensitive to motion in a first direction to vary the light transmitted through said optical system and such that said system is relatively insensitive to motion in a second, orthogonal direction in the amount of light applied through said optical system.

4,493,213

RANDOM VIBRATIONS TESTING DEVICE

Yan S. Uretsky; Ravil V. Mnekin, both of Kazan; Viktor G. Rygalin, Moscow; Dmitry A. Grechinsky, Moscow, and Viktor A. Klochko, Moscow, all of U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Introskopii and Kazansky Aviatsionny Institut Imeni A. N Tupoleva, both of, U.S.S.R.

Filed Nov. 5, 1982, Ser. No. 439,618
Int. Cl.³ G01M 7/00
U.S. Cl. 73—664 **2 Claims**



1. A random vibrations testing device, comprising:
a noise generator having an output;

a wide-band filter having an output and an input connected to the output of said noise generator;

a switch having a first pair of switch contacts and a second pair of switch contacts;

narrow-band in-phase signal shaping channels connected in parallel to the output of said wide-band filter, each of said channels comprising said first pair of switch contacts connected to the output of said wide-band filter, a narrow-band amplification filter connected in series with said first pair of switch contacts, an attenuator connected in series with said narrow-band amplification filter, and said second pair of switch contacts connected in series with said attenuator; and

means for shaping spikes and dips in a shaped signal spectrum, said means being connected to the output of said wide-band filter and to said narrow-band in-phase signal shaping channels, said means including a common adder connected in common to said narrow-band in-phase signal shaping channels, said common adder shaping spikes in the shaped signal spectrum and having an output, one input connected to the output of said wide-band filter, and additional inputs respectively connected to said second pair of switch contacts of said channels, and additional individual adders for shaping dips in the shaped signal spectrum, each of said additional adders having an output and inputs, an input of a first said additional adders being connected to the output of said common adder, and the output of each of said additional adders, excluding the first of said additional adders, being connected to one of the inputs of the next-adjacent one of said additional adders.

4,493,214

TRANSDUCERS FOR PROVIDING AN ELECTRICAL SIGNAL REPRESENTATIVE OF PHYSICAL MOVEMENT

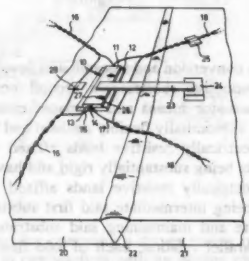
Peter F. Roach, Croft, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 6, 1982, Ser. No. 433,106

Claims priority, application United Kingdom, Oct. 8, 1981, 8130428

Int. Cl.³ G01B 7/16

U.S. Cl. 73—779 **4 Claims**



1. A transducer for providing an electrical signal representative of physical movement comprising a first support (11) for supporting a first mineral insulated conductor (15) of a first electrical circuit (16) alongside a second mineral insulated conductor (17) of a second electrical circuit (18) in a second support (12) so that inductive coupling exists between the conductors and so that the two supports can move relative to each other to change the spacing between the conductors characterised in that said supports are in the form of two plates (11, 12) in sliding face contact with parallel linear slots (13, 14) for the conductors (15, 17) in the contact faces of the plates.

4,493,215

VIBRATOR DAMPING FLOW METER

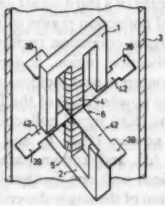
Theodor Gast, Berlin; Kurt Binder, Stuttgart, and Günter Hönig, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1982, Ser. No. 388,890

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124506

Int. Cl.³ G01F 1/20, 1/78

U.S. Cl. 73—861.18 **15 Claims**



1. Throughout meter for flowing media comprising an electromagnetically vibratory body having portions thereof located in a flow duct so as to be damped to an extent dependent on the flow throughput in the duct and a magnet system for exciting the vibrations of said body and for compensating for the damping of said vibrations, said meter further comprising the improvement wherein:

said vibratory body (6) is made of magnetically conducting material in cross shape with beams (42) carrying baffle members (39) at their ends, and

said magnet system is arranged to vibrate said beams in flexure so that the crossed beams vibrate with the ends of both beams vibrating in the same sense as the result of excitation alternately attracting in opposite directions first the ends of one beam and then the ends of the other, the one beam returning by spring action while the other is attracted.

4,493,216

METHOD AND APPARATUS FOR CONDUCTING FLOW MEASUREMENTS ON FLOWING MEDIA ACCORDING TO THE ULTRASONIC DOPPLER METHOD

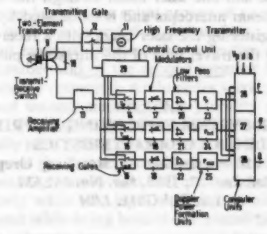
Dieter Hassler, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,617

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147197

Int. Cl.³ G01F 1/66

U.S. Cl. 73—861.25 **12 Claims**



1. Method for conducting flow measurements on flowing media, in particular, blood in blood vessels, according to the ultrasonic Doppler method, said method comprising:

(a) selecting by means of different first and second ultrasonic beam configurations and by means of first and second signal gate adjustments, respectively, first and second Doppler signal collection regions of a flowing medium, which signal collection regions differ in perimeter, the first signal collection region being dependent upon the incident angle of the first ultrasonic beam configuration,

(b) measuring the powers (P_{m1} and P_p), of the Doppler signals arriving from the first and second signal collection regions,

(c) selecting by means of a third ultrasonic beam configuration and by means of a third signal gate adjustment, a third Doppler signal collection region of said flowing medium, which third signal collection region, compared with the first signal collection region, is dependent in a complementary fashion upon said incident angle,

(d) measuring the power (P_{m2}) of the Doppler signals originating from the third signal collection region, and

(e) relating the powers (P_{m1}, P_p and P_{m2}) resulting from steps (b) and (d), and known parameters of the signal collection regions with one another in such a fashion that, with cancellation of the angle-dependency, the flow cross-sectional area and/or the flow velocity directly results.

4,493,217

PROCESS AND APPARATUS FOR MEASURING TRAVEL TIME DIFFERENCES OF ULTRASONIC PULSES FOR THE DETERMINATION OF FLOW FIELDS

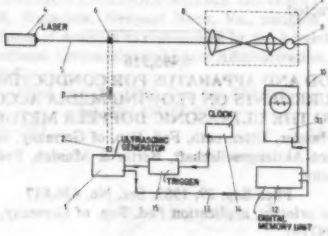
Rolf Engler, and Rudolf Wulf, both of Göttingen, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,862

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132526

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.27 **9 Claims**



1. A process for determining flow field velocities in a gaseous media comprising the steps of transmitting at least one ultrasonic pulse and one laser beam through the media such that the laser beam intercepts and is modulated by the ultrasonic pulse, registering the laser beam with a receiver means, and registering the travel time of the ultrasonic pulse.

4,493,218

TRANSDUCER SYSTEM EMPLOYING A SPRING WITH LINEAR CHARACTERISTICS

James C. Kyle, 610 Woodwillow St., Roseburg, Oreg. 97470

Filed Jan. 27, 1983, Ser. No. 461,631

Int. Cl.³ G01L *1/04*

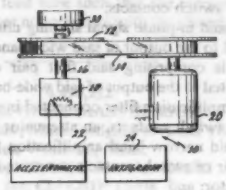
U.S. Cl. 73—862 **14 Claims**

1. In combination,

a pulley,

a spring disposed on the pulley and having characteristics for producing a force substantially linearly related to the displacement of the spring relative to the pulley,

means for driving the spring to become wound on the pulley or to become unwound from the pulley, and



means for converting the displacement of the spring into a signal having characteristics linearly related to the displacement of the spring.

4,493,219

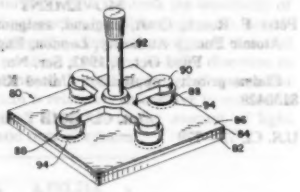
FORCE TRANSDUCER

Larry L. Sharp, Schaumburg, and Mark Klosinski, Chicago, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Aug. 2, 1982, Ser. No. 404,266

Int. Cl.³ G01L *5/22*; H01C *10/10*

U.S. Cl. 73—862.05 **6 Claims**



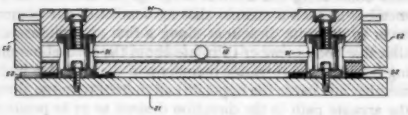
1. An energy conversion [illegible] transmission device comprising a first non-conductive [illegible]e, a second non-conducting substrate, an actuator mea[illegible] spacer means; said first substrate being substantially fl[illegible]exible [illegible] having a first plurality of electrically resistive lands affixed thereto; said second substrate being substantially rigid and having a second plurality of electrically resistive lands affixed [illegible] to said spacer means being intermediate said first substrate and said second substrate and maintaining said substrates in spaced, substantially parallel relation; each of said first plurality of resistive lands being in facing [illegible] with and in register with one of said second plurality [illegible] resistive lands, said spacer means having a plura[illegible]ures therethrough, each of said plurality of apertures being in register with one of said first plurality of resistive lands; said actuator means comprising a plurality of elastomeric actuators, each of said plurality of actuators being in register with one of said first plurality of resistive lands; said actuator means further comprising a common actuator carrier, each of said actuators being connected to said common actuator carrier; said actuator means further comprising a common control means, said common actuator carrier being connected to and responsive to said common control means.

4,493,220

FORCE MEASURING PLATFORM AND LOAD CELL THEREFOR USING STRAIN GAGES TO MEASURE SHEAR FORCES

Forest J. Carignan, Bedford, and Nathan H. Cook, Cambridge, both of Mass., assignors to Advanced Mechanical Technology, Inc., Newton, Mass.

Filed Nov. 23, 1982, Ser. No. 443,939
Int. Cl.³ G01L *1/18, 5/16*
U.S. Cl. 73—862.66 8 Claims



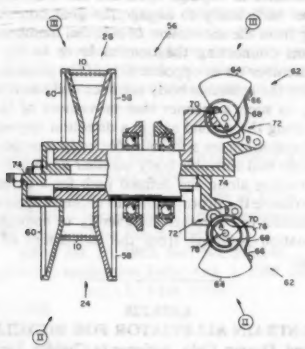
2. A force measuring apparatus comprising a plate supported on a plurality of load cells, each load cell comprising a cylindrical tubular column having a center axis perpendicular to the plate and having strain gages mounted thereon to measure tensile and compressive strain occurring at 45° to the axis of the load cell and associated with the shear strain due to force applied transverse to the center axis of the load cell, the strain gages of a plurality of load cells being interconnected to provide an indication of said force.

4,493,221

VARIABLE SPEED, BELT DRIVEN TRANSMISSION SYSTEM, SPEED SENSING DRIVER PULLEY AND METHOD

Richard F. Stieg, Boulder; John P. Dolan, Littleton; W. Spencer Worley, Aurora, and Tristan Juergens, Conifer, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 12, 1983, Ser. No. 457,338
Int. Cl.³ F16M *55/52;* B60K *41/04*
U.S. Cl. 474—14 5 Claims



1. A method for operating a driver pulley of a belt driven transmission in conjunction with an engine characterized by charted interrelationships between engine speed, engine torque and brake specific fuel consumption (BSFC); the transmission of the type with a driven pulley having axially separable pulley halves responsively operable to axial forces variable with engine speed for closing the driver pulley halves together; a V-belt entrained by the driver and driven pulleys; the driven pulley axial forces and driven axial forces cooperatively causing variable belt tensions for transmitting predetermined power loads between the driver and driven pulleys from (1) a maximum (speed down) ratio where the driver pulley halves are axially separated to a full open position and the driven pulley halves are positioned axially together to a full closed position by means of an actuator to (2) a minimum (speed up) ratio where the driver pulley halves are axially together to a full closed position and the driven pulley halves are axially separated to a full open position; comprising the steps of:

selecting a desired operating line for the transmission from the charted engine interrelationships where the line is monotonic in torque and has a slope from about 0.004 lb.-ft/rpm to about 0.060 lb.-ft/rpm;

determining the maximum torque at the driver pulley;

determining a family of driven pulley axial forces based on the maximum torque at the driver pulley;

determining a family of required driver pulley axial forces for traction ratio equilibrium of the driver and driven pulleys at selected torques on the operating line;

determining the speeds at which driver pulley axial forces for equilibrium are required to meet the selected torques on the operating line;

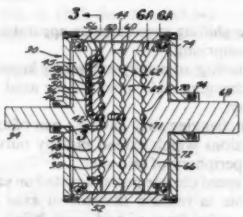
providing the required driver pulley axial forces by means of a torsional spring with a centrifugal weight attached to one end of the spring and an articulated linkage operatively interconnected to the other end of the torsional spring, the axial forces provided by winding the torsional spring and biasing the axial force to close the driver pulley.

4,493,222

GEARLESS SPEED AND TORQUE CONVERTER

Otto R. Heine, Poway, Calif., assignor to R&H Technology, Inc., Minneapolis, Minn.

Filed Apr. 21, 1982, Ser. No. 370,593
Int. Cl.³ F16H *3/00, 11/00, 15/00, 13/02*
U.S. Cl. 74—216.3 28 Claims



1. A torque converter comprising:

a rotatable input shaft;

a first member mounted on the input shaft to rotate therewith, said first member having a surface having an Archimedes spiral groove of a first predetermined pitch incorporated in said surface;

a rotatable output shaft mounted coaxially with the input shaft;

a second member mounted on the output shaft to rotate therewith, the second member having a surface operatively interfacing with the surface of the first member, and having an Archimedes spiral groove of a second predetermined pitch incorporated in said surface;

ball means mounted between the respective surfaces of the first member and of the second member for being held between the respective Archimedes spiral grooves of the first and second members at a plurality of intersecting spaces of said spiral grooves, said ball means having substantially pure rolling contact with the Archimedes spiral grooves of the first and second members at said intersecting spaces, whereby said ball means move radially and circularly while said input shaft is rotated by an outside force and while being held in said plurality of intersecting spaces, whereby torque is transmitted from the input shaft to the output shaft, and

channel means provided in one of said first and second members for allowing said ball means to exit from the spiral grooves at a location radially remote from the input

shaft and to reenter said spiral grooves in a location proximate to the input shaft, whereby the ball means are continuously circulated to enter the spiral grooves to move circularly and radially outwardly between said spiral grooves.

4,493,223

GEAR SHIFTING SPEED CHANGE APPARATUS FOR A ROTARY ELECTRIC TOOL

Ichiro Kishi, and Hisao Nakagawa, both of Shiga, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 8, 1982, Ser. No. 415,981
Claims priority, application Japan, Oct. 5, 1981, 56-159273
Int. Cl.³ F16H *3/08*; F16D *21/00*; E21B *3/00*
U.S. Cl. 74—371 8 Claims

1. A gear shifting speed change apparatus for a rotary electric tool comprising:

a shaft having an axially extending keyway therein with a gear changing slide mounted for axial movement in said keyway;

said gear changing slide having a pair of axially spaced apart projections which extend radially outwardly beyond an outer periphery of said shaft;

a pair of speed change gears mounted on said shaft and freely rotatable in relation thereto, an axial distance between axially outer faces of said gears being less than an axial distance between said slide projections;

means to limit axial movement of said gears in relation to said shaft;

at least one axially inwardly extending recess on each said gear outer face;

means for axially sliding said gear changing slide in said keyway by using spring force so as to engage a recess of one of said gears and secure it for rotation with said shaft.

4,493,224

REMOTE MANUAL SHIFTING MECHANISM

Paul L. Speelman, Fredericksburg, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 4, 1982, Ser. No. 384,841
Int. Cl.³ B60K *20/00*; F16C *1/10*
U.S. Cl. 74—473 R 14 Claims

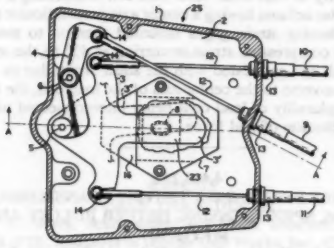
2. A remote manual shifting mechanism for engaging selected gear combinations of a motor transmission of the type having an opening through the casing thereof providing access to rail members therewithin whose positioning and movement enables the engagement of the particular gear combinations selected, said mechanism comprising;

a rotatable body member pivotally mounted to the transmission casing,

a slideable body member having one end thereof pivotally mounted to an end of the rotatable body member on one side of the rotatable mounting between the rotatable body member and the transmission casing, said slideable body member able to slide in opposite directions along a defined path with respect to the transmission casing and having an opposite end thereof that is able to move in opposite directions along an arcuate path that is generally transverse to the defined path,

a protuberance extending from said slideable body member opposite end through the opening in the transmission casing, said protuberance able to be positioned adjacent a particular rail member selected in response to the movement of said slideable body member opposite end along the arcuate path,

means connecting the control lever to the slideable body member in such a manner that movement of the control lever in opposite directions along a first axis causes said slideable body member to rotate about the pivotal mounting between the rotatable member and the slideable body member and cause the opposite end thereof to move along the arcuate path in the direction desired so as to position the protuberance adjacent the selected rail member and



movement of the control lever in one opposite direction along a second axis that is different from the first axis causes the slideable body member to slide in one direction along the defind path for a distance, sufficient to cause the protuberance to impinge upon and move the selected rail member sufficiently to engage the gear combination resulting from the movement of said rail member,

and means connecting the control lever to the rotatable body member on an opposite side of the pivotal mounting between the rotatable body member and the transmission casing, in such a manner that movement of the control lever along the second axis in a direction opposite to said one direction causes said rotatable body member to rotate and cause said slideable body member to slide in an opposite direction along the defined path for a distance sufficient to cause the protuberance to impinge upon and move the selected rail member sufficiently to engage the gear combination resulting from the movement of said rail member.

4,493,225

NECK-STRAIN ALLEVIATOR FOR BICYCLISTS

Giles Galahad, Denver, Colo., assignor to Chaldar, Inc., Denver, Colo.

Filed Sep. 30, 1982, Ser. No. 430,876
Int. Cl.³ B62K *21/16*
U.S. Cl. 74—551.3 3 Claims

1. A device for use to alleviate neck strain of bicyclists by providing hand-adjustability of bicycle handlebar position to bicycle handlebars within a handlebar cavity of a bicycle handlebar stem, the handlebar cavity securing the bicycle handlebars against mmovement when a bolt within a bolt cavity of the stem is tightened, the device being for use both with a stem having

a slot within the bolt cavity of the stem, the slot adapted to engage a fin of a bolt, the slot and the fin cooperatively interacting to prevent rotation of the bolt,

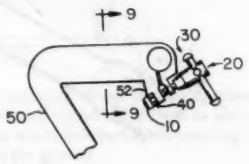
and with a stem having a ledge, the ledge adapted to abut

polygonal-head means of a bolt when the bolt is positioned within the bolt cavity of the stem, the ledge and the polygonal-head means cooperatively interacting to prevent rotation of the bolt;

the device comprising:

a finned threaded bolt, having a head and shank portion, and a fin, said fin attached to and extending between said head and shank portions, the fin engaging said slot within the bolt cavity of a stem when said finned threaded bolt is positioned within the bolt cavity, the slot and the fin cooperatively interacting to prevent rotation of the bolt;

a polygonal-sided slotted collar, having an interior slot, the interior slot engaging the fin of said finned threaded bolt when said collar is positioned upon said finned threaded bolt, thereby rendering said collar non-rotatable relative to said finned threaded bolt, the polygonal sides of said collar then serving as polygonal-head means for said finned threaded bolt, the polygonal-head means adapted



to abut said ledge of a stem, when said finned threaded bolt is positioned within the bolt cavity of the stem, the ledge and the polygonal-head means of said collar then cooperatively interacting to prevent rotation of said finned threaded bolt;

a handle-support, having therein means adapted to engage a handle, and having therein a threaded cavity receiving said finned threaded bolt, said handle-support threaded onto a protruding threaded end of said finned threaded bolt when said finned threaded bolt is positioned within the bolt cavity of the stem; and

a handle, engaged by said handle-support, adapted, when turned to transmit sufficient force to said handle-support when said handle-support is threaded onto said finned threaded bolt positioned within the bolt cavity of the stem, so as to thereby tighten or loosen said finned threaded bolt and thus thereby to tighten or loosen bicycle handlebars within the handlebar cavity of the stem.

4,493,226

CRANKSHAFT FOR SMALL RECIPROCATING MACHINES

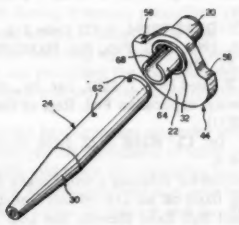
Norbert Andrione; Federigo Peruzzi, both of Turin, and Giancarlo Scandurra, Cuorgnè, all of Italy, assignors to Aspera S.p.A., Castelnuovo Don Bosco, Italy

Filed Jul. 14, 1982, Ser. No. 398,146

Claims priority, application Italy, Aug. 3, 1981, 68090 A/81

Int. Cl.³ F16C *3/04*

U.S. Cl. 74—598 **2 Claims**



1. A crankshaft for small reciprocating machines, particularly hermetic compressors for refrigerators of the type comprising a crankpin adapted to be connected to one end of a connecting rod, an eccentric having a flat sector formed with opposed faces and an elongated tubular element disposed in succession along the longitudinal direction of the crankshaft, said elongated tubular element being disposed non-coaxial with respect to the crankpin and acting partly as a journal and partly as a support for a rotary member such as a rotor of an electric motor wherein said crankpin and said eccentric are formed in a single sintered metal piece and the elongated tubular element is constituted by separate piece of soft steel tube, interfitting, complementary annular formations disposed on one of said faces of said eccentric and on one end of said tubular element and means for connecting said annular formations together, said annular formation on said one end of said tubular element being a terminal seat formed in the internal surface thereof and said annular formation disposed on said eccentric is an annular boss which is engaged in said seat and wherein said crankpin is tubular and has a longitudinal internal duct which opens through said eccentric and said boss has a longitudinal cut aligned with said duct to define a channel for conveying lubricating oil from the interior of said tubular element to said duct.

4,493,227

SELF-LOCKING DIFFERENTIAL GEAR UNIT; MORE SPECIALLY FOR MOTOR VEHICLES

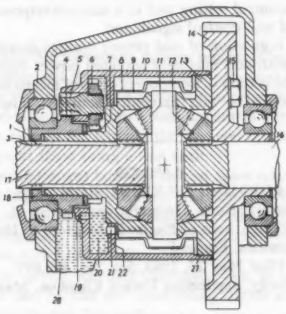
Leopold F. Schmid, Leharstrasse 8/9. OG., D-7000 Stuttgart 1, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,842

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115035

Int. Cl.³ F16H *1/44*; F16D *31/00, 57/00*

U.S. Cl. 74—711 **5 Claims**



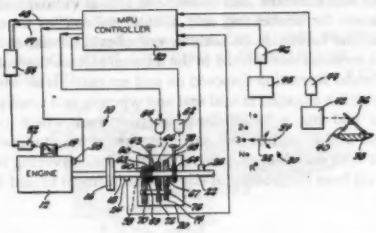
1. In a self-locking differential gear unit having a powered differential gear housing bearinged in an axle drive housing and within which two axle bevel wheels for driving two axle shafts are positioned, such bevel gear wheels meshing with differential gear wheels, and a non-positive coupling placed outside the differential gear housing for locking the differential gear unit, one half of said coupling being joined with the differential gear housing and the other coupling half being joined with one of the two axle shafts, the invention residing in that the two coupling halves take the form of blade rings of a hydrodynamic coupling and in that the gear unit has change speed gearing, such change speed gearing being designed for producing an increase in speed, on one of said axle shafts turning faster than the other, responsible for said one blade ring turning faster than the axle shaft driving the same.

4,493,228

THROTTLE CONTROL SYSTEM FOR AN AUTOMATIC SHIFT COUNTERSHAFT TRANSMISSION

William J. Vukovich, and Michael R. Grimes, both of Ypsilanti, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 135,665, Mar. 31, 1980, abandoned.
This application Dec. 10, 1981, Ser. No. 329,395
Int. Cl.³ B60K 41/18
U.S. Cl. 74—858 12 Claims



1. A method for bringing the setting of a power control means for a power source into correspondence with a manually actuated power control setting upon completion of a shifting mode of operation of a transmission that is driven by the power source wherein the power control means is regulated in accordance with (1) a manually actuated power control setting during non-shift modes of operation and (2) transmission shift requirements during shifting modes of operation, said method comprising the steps of:

generating a control signal as a function of the difference between the setting of said power control means and said manually actuated power control setting upon engagement of a desired gear ratio;

adjusting said power control means in a direction to bring its setting into correspondence with said manually actuated power control setting and at a rate corresponding to the value of said control signal; and

resuming regulation of said power control means in accordance with said manually actuated power control setting when the setting of said power control means substantially corresponds to said manually actuated power control setting.

4,493,229

FORMING OF EXTRUSION DIES

David E. Stewart, Down Hatherly, and George R. Nicholson, Swindon Village, both of England, assignors to Hobson Limited, Cheltenham, England

Filed May 25, 1983, Ser. No. 498,097
Claims priority, application United Kingdom, May 25, 1982, 8215216
Int. Cl.³ B21K 5/20; B21C 25/10, 25/02
U.S. Cl. 76—107 A 10 Claims

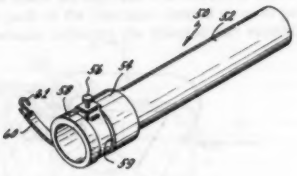
1. A method of forming an extrusion die comprising forming an extrusion aperture in a die piece, forcing a flowable material at least partly through the extrusion aperture so that the leading surface of the material becomes deformed in the extrusion direction, and then reshaping the die piece in such a manner that the axial bearing depth of the extrusion aperture at any location around its periphery corresponds to the deformation of the leading surface of the flowable material at that location.

4,493,230

APPARATUS TO OPEN AND CLOSE A METER RING

Enoch A. Hughes, 13404 Wheeler Ave., Sylmar, Calif. 91342

Filed Jan. 24, 1983, Ser. No. 460,181
Int. Cl.³ B25B 27/00
U.S. Cl. 81—3 R 11 Claims



1. An apparatus for opening and closing a meter ring wherein the ring includes end portions extending outwardly and with each end portion including at least one opening, including,

an elongated handle,

a head portion located at one end of the handle and with the head portion having a substantially cylindrical configuration,

the head portion including an outwardly extending lug located at a first circumferential position and an outwardly extending strap including hook at the end of the strap located at a second circumferential position,

the lug for insertion into the opening in one of the end portions to capture the head portion between the end portions and with rotation of the elongated handle forcing the head portion between the end portions to spread the meter ring, and

the hook at the end of the strap for insertion into the opening in the other of the end portions to have the strap extend across the end portions and with the head portion outside the one end portion and with rotation of the elongated handle forcing the head portion against the outside of the one end portion to force the end portions together to close the meter ring.

4,493,231

METHOD AND DEVICE FOR MACHINING BRAKE DISKS

Hans Wössner, Aldinger Str. 96, Stuttgart-50, D-7000, Fed. Rep. of Germany

PCT No. PCT/DE81/00194, § 371 Date Jul. 6, 1982, § 102(e) Date Jul. 6, 1982, PCT Pub. No. WO82/01678, PCT Pub. Date May 27, 1982
PCT Filed Nov. 7, 1981, Ser. No. 396,907
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 8030325[U]
Int. Cl.³ B23B 3/22, 5/04, 19/02
U.S. Cl. 82—4 A 11 Claims

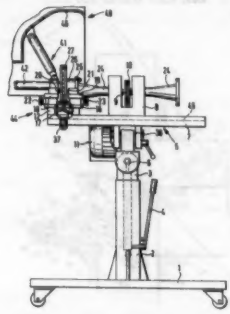
1. An apparatus for refacing a worn brake disk of a vehicle, the disk being fixed on an axle of said vehicle, the axle also having a wheel hub fixed thereto, the axle being resiliently mounted on a body of said vehicle, the apparatus comprising:

at least one refacing tool;

a displaceable tool carrier mounted on a longitudinal carrier for movably positioning the tool with respect to the disk;

a rotary drive means having a drive shaft for turning said axle; and,

a mounting means for supporting the tool, tool carrier and drive relative to said axle, the mounting means having a



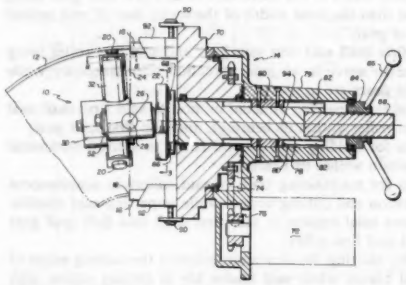
coupling and centering device for rigidly connecting the rotary drive to said wheel hub affixed to said axle and a chassis serving as a mobile carriage supporting the apparatus relative to the ground.

4,493,232

ADJUSTABLE MANDREL FOR PORTABLE LATHE

Lawson H. Nall, Folsom, Calif., assignor to TRI Tool, Inc., Rancho Cordova, Calif.

Filed Nov. 24, 1982, Ser. No. 444,153
Int. Cl.³ B23B *3/22, 5/16*
U.S. Cl. 82—4 C **16 Claims**



1. A mandrel for a portable lathe including at least one orbiting tool bit and having a cutting plane defined as the plane including the orbital path of movement of the tool bit or bits driven by the lathe during a turning procedure, comprising:

a mandrel housing having a longitudinal axis;

radially extendable securing leg means and actuator means for extending and retracting the leg means radially of the longitudinal axis for securing the mandrel within a hollow workpiece;

lathe support means having means pivotally secured to the housing limiting pivotal movement of same only about a single miter axis, said miter axis extending transversely of and intersecting said longitudinal axis, said lathe support means including means to receive and be attached to a portable lathe with said miter axis extending parallel to the cutting plane of such a lathe; and

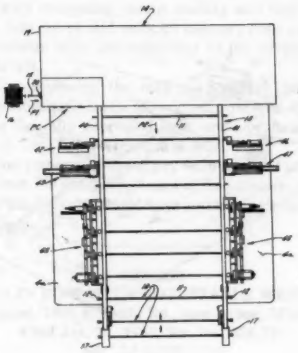
means for releaseably locking said lathe support means in fixed angular position relative to said miter axis.

4,493,233

APPARATUS FOR CUTTING AND CONVEYING SEGMENTS OF WIRE OR CABLE

Robert O. Dusel, Brookfield; James J. Berres, and Harold J. Keene, both of Milwaukee, all of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 22, 1983, Ser. No. 507,231
Int. Cl.³ B26D *7/06*
U.S. Cl. 83—71 **19 Claims**



19. Apparatus for repeatedly cutting segments from a strand of wire or cable and for conveying them to work stations so that either or both ends can be processed to provide a partly or fully finished wire lead or cord, said apparatus comprising:

a feed mechanism for moving the free end of said strand in incremental steps along a first path;

inboard and outboard laterally spaced apart conveyor units for moving segments cut from said strand in incremental steps along a second path transverse to the first path, each unit comprising a pair of endless flexible belts having separable soft-faced confronting flights;

a separator device for each conveyor unit to periodically separate and reclose the confronting flights at a location aligned with said first path;

a set of periodically closable and reopenable wire guide members on each side of each conveyor unit and aligned with said first path and operable by the associated separator device so that when the associated confronting flights are open the wire guide members are closed and vice-versa;

an independently openable elongated wire guide located between said conveyor units in alignment with the sets of wire guide members;

a cutter located between the feed mechanism and the set of wire guide members on the outside of the inboard conveyor unit;

and drive mechanisms and a programmable controller for operating the feed mechanism, the conveyor units and their associated separator devices and wire guides, and the cutter in synchronism.

4,493,234

DEVICE FOR STRAIGHTENING AND CUTTING A TEXTILE STRIP

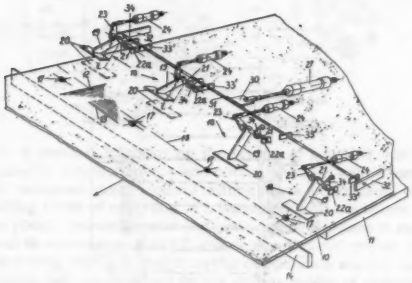
Hans Ziegler, Grossbardorf; Siegfried Henze, Hohenroth; Rainer Dippert, Bad Königshofen; Martin Schnaus, Grosselbstadt, and Horst Golda, Saal, all of Fed. Rep. of Germany, assignors to Texpa-Arbter Maschinenbaugesellschaft mbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 250,200, Apr. 2, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 544,070

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013050

Int. Cl.[3] B26D *5/42*

U.S. Cl. 83—175 6 Claims



1. A device for straightening and cutting a distorted strip article having a marking thereon, comprising:

means for feeding the strip article from a source of supply to a predetermined position for straightening;

means for straightening the article when in said predetermined position, said straightening means comprising a plurality of independently movable straightening elements disposed substantially transversely to the longitudinal direction of the strip article, a transport device for independently adjusting said straightening elements in the longitudinal direction of the strip article, means for pressing said straightening elements independently against the strip article as it is fed toward said predetermined position so that said straightening elements pressed against the strip article move with it toward said predetermined position, and sensor means for controlling said pressing means in response to control signals produced by the marking on the article, said transport device serving to align said straightening elements after they are pressed against the strip article substantially transversely to the longitudinal direction thereof to straighten the strip article when it is in said predetermined position;

means for cutting the article after it has been straightened by said straightening means;

said pressing means serving to move said straightening elements out of engagement with the strip article after it has been cut by said cutting means; and

carriages supporting said straightening elements for movement in a substantially vertical plane, and means for movably supporting said carriages for movement between a first position wherein they are coupled with said transport device to be moved therewith to a starting position after the cutting of the strip article, and a second position wherein they are released from said transport device during the engagement of said straightening elements with the strip article.

4,493,235

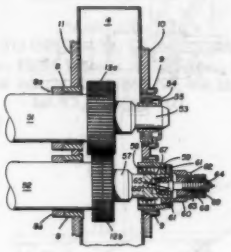
AXIALLY ADJUSTABLE HELICAL CUTTING BLADES FOR ROTARY WEB SHEARING MACHINE

Merrill D. Martin, 2 Mall Ct., Oakland, Calif. 94608

Filed Apr. 15, 1983, Ser. No. 485,451

Int. Cl.[3] B23D *25/12*

U.S. Cl. 83—303 6 Claims



1. In a rotary web shearing machine having at least a first roller and a second roller each of said rollers having positioned on their outer surfaces helical cutting blades arranged for co-acting with each other and means for driving said rollers in opposite directions of rotation so as to produce a cutting action between cutting edges on said blades;

said rollers being mounted on shafts in bearings positioned in bearing housing on a frame of said machine;

said means for driving said rollers in opposite directions comprising a first spur gear and a second spur gear positioned on opposite ends of said shafts on said first roller and said second roller respectively and meshing with each other;

said spur gears being of the backlash preventing type;

the total width of the tooth face of said first spur gear being less than the total width of the tooth face of said second spur gear;

said first shaft said first spur gear and said first roller being free to move in an axial direction simultaneously while said gears are in mesh;

means for imparting an axial motion to said first shaft said first roller within its bearings, and said first spur gear;

means for holding said second roller in a fixed horizontal position within its bearings;

means for maintaining both of said rollers in simultaneous rotation and cutting action while imparting said simultaneous axial motion to said first shaft said first spur gear and said first roller;

thereby altering the clearance between the cutting edges of said blades while said blades are in cutting action with each other.

4,493,236

MAILING MACHINE TAPE KNIFE

William D. Toth, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 25, 1983, Ser. No. 516,837

Int. Cl.[3] B26D *1/14*

U.S. Cl. 83—440.1 5 Claims

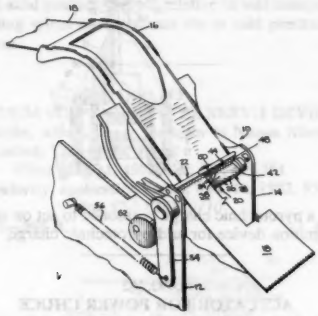
1. A device for cutting roll tape, including:

a frame;

a serrated rotary blade pivotably mounted in said frame, said rotary blade having a plurality of cutting teeth formed by grooves running perpendicular to the axis of the rotary blade and a flat surface cut across said rotary blade, said rotary blade having at least one continuous groove at each end of said serrated rotary blade adjacent said plurality of cutting teeth;

a serrated stationary blade pivotably mounted on said frame, said stationary blade having a plurality of cutting teeth,

said stationary blade cutting teeth being meshable with said cutting teeth on said rotary blade, said stationary blade also having at least one long tooth at each end of said stationary blade adjacent said plurality of short cutting teeth, said long teeth reaching the tangency of said



continuous grooves and riding therein, and wherein said cutting teeth are sufficiently shortened to provide the desired clearance at the cutting interface; and

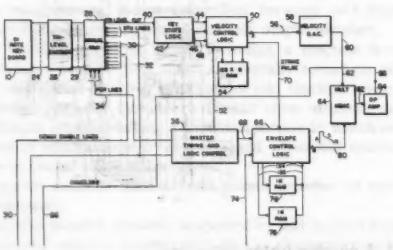
means for biasing said long teeth of said stationary blade into said continuous grooves of said rotary blade.

4,493,237

ELECTRONIC PIANO

Charles E. DeLong, Dubois, and Gary A. Eck, Otwell, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 13, 1983, Ser. No. 503,529
Int. Cl.³ G01H *1/02*
U.S. Cl. 84—1.26 **21 Claims**



1. An electronic keyboard musical instrument comprising:

a keyboard having a plurality of playing keys adapted to be depressed, each of said keys having the capability of being selectively in a nominal undepressed state, a nominal partially depressed state, and a nominal fully depressed state,

multiplex means for multiplexing said keyboard and developing a plurality of time slots corresponding on a one-to-one basis to said keys and generating key state signals in said time slots each indicating whether the pertaining key is in its undepressed, partially depressed or fully depressed state,

velocity computing means time shared among the keys of the keyboard and responsive to the key state signals for computing, each time slot of a scan of the keyboard, velocity data correlated to the amount of time that the pertaining key, if partially depressed, has been in its partially depressed state, and storing said data in corresponding locations of a velocity memory assigned to the pertaining keys, said computing means accessing data in said velocity memory, updating said data on subsequent scans as long as the pertaining keys are still in their partially depressed states, and storing final values of said velocity data in the memory locations assigned to the keys as the pertaining keys reach their fully depressed states,

envelope generator means time shared among the keys of the keyboard responsive to the key state signals for computing and outputting envelopes for the fully depressed keys, each envelope comprising a plurality of discrete amplitude levels computed in the time slots of the pertaining keys during a respective plurality of scans of the manual, said envelope generator means storing data correlated to the amplitude level calculated during each time slot of the scan in locations of an envelope memory assigned to the pertaining keys to provide a reference for the amplitude level calculated on a subsequent scan,

said velocity computing means reading said final value velocity data out of said velocity memory onto an output in synchronism with the outputting of the envelope amplitude levels,

means for combining the read out velocity data and the output amplitude levels to produce on a time shared basis among the fully depressed keys envelopes scaled by the velocity data for the respective keys, and

tone means responsive to the key state data and to the scaled envelopes for generating tones of frequencies corresponding to the fully depressed keys and having respective said envelopes.

4,493,238

VIOLIN BOW WITH ADJUSTABLE WEIGHT

Ruggiero Ricci, 2930 E. Delhi Rd., Ann Arbor, Mich. 48103

Filed Jan. 17, 1983, Ser. No. 458,236
Int. Cl.³ G10D *3/16*
U.S. Cl. 84—282 **6 Claims**

1. In combination with a bow for string type musical instruments wherein said bow includes an elongated rod section having a frog at one end and a tip at the opposite end, and hair mounted on and extending between said frog and said tip, said hair being engageable with the strings of a musical instrument during use, means for controlling the bounce characteristics of said bow on said strings comprising weight means adjustably mounted on said rod section intermediate said ends thereof for movement lengthwise of said rod section between a plurality of positions thereon.

4,493,239

RANGE CLEARANCE BY ENHANCING OXIDATION OF FERROUS ORDNANCE IN-SITU

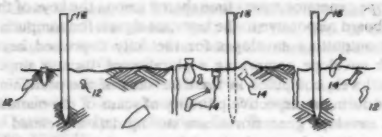
Marvin A. Pedersen, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1982, Ser. No. 369,377
Int. Cl.³ F41F *5/02*
U.S. Cl. 89—1.13 **17 Claims**

1. A method of clearing a target range by rendering safe unexploded ordnance buried in the ground comprising the steps of:

adding electrolyte to the soil around buried unexploded ordnance to a depth below the deepest buried unexploded ordnance and maintaining it at a high moisture content for enhancing local galvanic action for accelerating destructive corrosion of metallic parts of the unexploded ord-

nance; applying direct current voltage through the soil for introducing stray currents therein, and



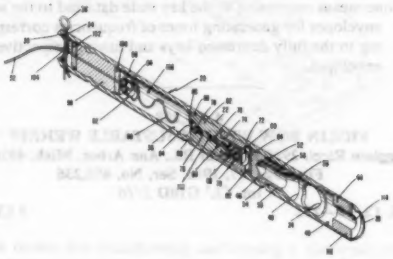
allowing time for destructive corrosion to occur to render the unexploded ordnance safe.

4,493,240

PARACHUTE LINE CUTTING DEVICE

Jeffery R. Norton, Spooner, Wis., assignor to Stressu Laboratory, Inc., Spooner, Wis.

Filed Feb. 1, 1983, Ser. No. 463,021
Int. Cl.³ B64D 5/12; F42B 4/02
U.S. Cl. 89—1.14 18 Claims



17. A method of severing a line which passes through a housing comprising the steps of:

frictionally igniting an ignition charge to generate hot gases within the housing;

allowing the hot gases to ignite a starter charge spaced from the ignition charge;

delaying detonation of an explosive charge by burning a delay charge between the starter charge and the explosive charge;

insulating the delay charge to impede heat transfer away from that charge; and

detonating the explosive charge to drive a knife toward an anvil with the line to be severed therebetween.

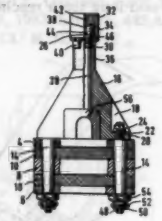
4,493,241

DEVICE OPERATING BY MEANS OF PYROTECHNIC CHARGES FOR RELEASING JOINTS SUBJECT TO LOAD

Rudolf Oliva, Cremlingen, and K. Ulf Schmidt, Brunswick, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e. V., Cologne, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,926
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208401
Int. Cl.³ F42B 3/00
U.S. Cl. 89—1.14 5 Claims

1. A device, acting by means of a pyrotechnic charge, for the release of at least one joint between a plurality of constructional components subject to load, including a plurality of bolts acted on by transverse forces, the device comprising a housing to which the bolts are connected having a cylindrical bore therein, the axis of which lies substantially in the direction of the resultant of the forces necessary to release the joint by extracting said bolts, a piston supported on one of the constructional components and engaging in the cylindrical bore of said



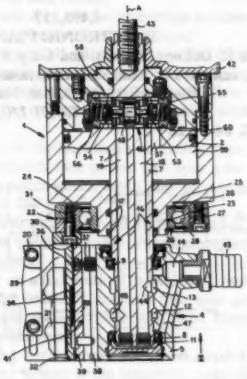
housing, a pyrotechnic charge positioned to act on said piston, and an ignition device for said pyrotechnic charge.

4,493,242

ACTUATOR FOR POWER CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,879
Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117850
Int. Cl.³ F01B 31/12
U.S. Cl. 91—1 10 Claims



1. A chuck actuator comprising:

a cylinder extending along a main axis;

a piston axially displaceable in said cylinder and forming therein two compartments, said piston having an axially backwardly extending stem also centered on said axis and formed with two respective intake passages each having one end opening into the respective compartment and another end opening at a respective location on said stem;

a connector rotatable about said axis on said stem and provided with respective fittings communicating with said locations;

means including first and second axially spaced bearings for preventing said connector from moving axially on said stem;

means for feeding fluid under pressure alternately to said fittings to pressurize and depressurize the respective compartments and thereby axially displace said piston in said cylinder, whereby said cylinder is connected to a chuck body and said piston to a chuck-actuating member for fluid actuation of said member;

an axially extending guide fixed on said connector;

an axially extending bar slidable axially in said guide; means including a third bearing distinct from the first and second

bearings for linking said bar to said cylinder for joint axial movement therewith but rotation relative thereto; and

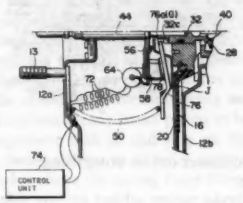
sensor means including at least one element carried on said bar and another element on said connector adjacent said guide and engageable with said one element in a predetermined axial position thereof relative to said connector for detecting when said elements are in said predetermined position.

4,493,243

VACUUM SUSPENDED TYPE SERVO DEVICE

Osamu Horibe, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 31, 1983, Ser. No. 499,251
Claims priority, application Japan, Jun. 16, 1982, 57-102162
Int. Cl.³ F15B 9/10
U.S. Cl. 91—369 B **6 Claims**



1. A vacuum suspended type servo device comprising:

a housing;

a power piston movable in said housing;

an input member to which an input force is applied;

an output member to which the movement of said power piston is transmitted;

valve means operated by said input member to control the movement of said power piston;

force transmitting means interposed between said input member, said power piston, and said output member;

said force transmitting means including a reaction lever having a bent portion which is pivotally seated on said power piston to act as a fulcrum of said reaction lever;

a plunger member movable with said input member, said plunger member having a shoulder portion to which one end of said reaction lever is engaged when said reaction lever pivots to a certain degree;

a support member fixed to said output member to move therewith;

a reaction member movably supported by said support member, said reaction member including an elongated member which extends at an angle relative to said reaction lever and contacts at one side thereof with said reaction lever; and

moving means for moving said reaction member rotationally to shift the point of contact radially along said reaction lever.

4,493,244

PNEUMATIC DOOR OPERATOR

Rüdiger F. V. Stillfried, Barsinghausen, Fed. Rep. of Germany; Günter Seegers, West Bloomfield, Mich., and Günter Sebesta, Hemmingen, Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,550
Int. Cl.³ F15B 11/08, 13/044
U.S. Cl. 91—420 **2 Claims**

1. An electropneumatic door control arrangement, for operating a door between first and second positions, and including a source of pressurized air, comprising,

(a) a pneumatic door operator including first and second control chambers separated by a piston operable to a first and a second position as pressurized air is supplied to said first and second chambers, respectively,

(b) piston coupling means for operating a door to first and second positions as said piston operates between said first and second positions, respectively,

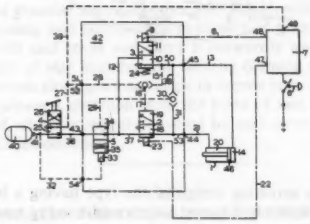
(c) a first and a second magnet valve, each having an electromagnet and a passage and a vent position and each in fluid communication with such pressurized air source, each valve is operable to the passage position when the associated electromagnet is energized,

(d) valve biasing means for biasing said second valve to said vent position when deenergized,

(e) manually controllable electrical switching means for alternately energizing said first and second magnet valve when operated sequentially at selected times between first and second conditions, respectively,

(f) said first magnet valve further in fluid communication with said door operator such that, when in said passage position, pressurized air is communicated to said first chamber, and when in said vent position, air is exhausted from said first chamber,

(g) said second magnet valve further in fluid communication with said door operator such that pressurized air is communicated to said second chamber and air is exhausted from said second chamber when said second magnet valve is energized or deenergized, respectively,



(h) said second magnet valve also in fluid communication with said first magnet valve such that, when said second magnet valve is energized, pressurized air is communicated to said first magnet valve to operate said first magnet valve to said vent position,

(i) a two position emergency valve in fluid communication with the air supply from such source, normally occupying a passage position so that pressurized air is communicated to both magnet valves, and when in the other emergency position, the supply of air is blocked from such source to both magnet valves and pressurized air is communicated to said switching means to inhibit energization of either magnet valve and to operate said first magnet valve to said vent position, and

(j) a two position choke valve connected between said emergency valve and said magnet valves, having a choke position and a normal non-choke position wherein pressurized air is freely communicated to said magnet valves, and

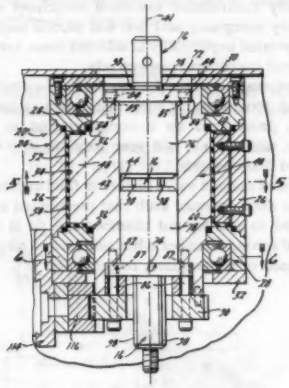
(k) choke operating means for responding to the blockage of air to both magnet valves with said emergency valve in its emergency position, said choke operating means operating said choke valve to its choke position for initially restricting the supply of air to said magnet valves when said emergency valve returns to its passage position, and for returning said choke valve to said non-choke position when a predetermined pressurized air value has been communicated through one of said magnet valves.

4,493,245

ROTARY AND LINEAR ACTUATING DEVICE

Jerry Kirsch, Grosse Pointe Farms; Kerry F. Kirsch, Livonia, and Kenneth J. Hornacek, Pontiac, all of Mich., assignors to Rimrock Corporation, Columbus, Ohio

Filed Apr. 22, 1983, Ser. No. 487,573
Int. Cl.³ F01B *21/00, 29/00*; F15B *15/24*
U.S. Cl. 92—2 8 Claims



1. In an actuating device of the type having a housing, a rotatable assembly disposed within said housing assembly for rotation about an axis, at least a portion of said rotatable assembly being radially spaced from an inside wall of said housing assembly, said rotatable assembly having at least one vane member protruding therefrom for rotational movement therewith, said movable vane member slidably and sealingly engaging said inside wall of said housing assembly, said housing assembly having at least one fixed vane member protruding therefrom in slidable and sealing engagement with said rotatable assembly, said fixed and movable vane members separating said space between said rotatable assembly and said inside wall into at least a pair of fluid pressure chambers, fluid pressurizing means for varying the relative fluid pressures in said chambers in order to selectively vary the rotary position of said rotatable assembly within said housing assembly, said rotatable assembly further including an elongated member extending generally coaxially through said rotatable assembly for rotational movement therewith, wherein said rotatable assembly includes a rotatable sleeve member having an opening extending substantially coaxially therethrough, linear bearing means coaxially received within said opening in said rotatable sleeve member for rotation therewith, said elongated member extending substantially coaxially through said linear bearing means, and ball spline means rotationally interconnecting said elongated member and said linear bearing means to allow linear axial movement of said elongated member relative to said housing assembly, the improvement comprising

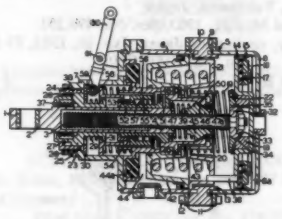
adjustment means for rotating said cylindrical members relative to each other and for fixedly securing said cylindrical members in their relatively rotated positions in order to adjust the amount of backlash in said ball spline means.

4,493,246

BRAKE CYLINDER WITH TWO PISTONS

Georges Dalibout, Gagny, France, assignor to WABCO Westinghouse Equipements Ferroviaires, Freinville-Sevran, France

PCT No. PCT/FR81/00132, § 371 Date Jun. 21, 1982, § 102(e) Date Jun. 21, 1982, PCT Pub. No. WO82/01405, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 20, 1981, Ser. No. 395,071
Claims priority, application France, Oct. 21, 1980, 80 22449
Int. Cl.³ F01B *9/00*
U.S. Cl. 92—13.8 6 Claims



1. A brake cylinder device comprising:

(a) a casing;

(b) a duty brake piston subject on one side thereof to the force of fluid pressure urging movement of said duty brake piston in a brake application direction;

(c) a screw-threaded rod;

(d) a non-rotatable thrust rod having an integral first nut member threadedly connected to said screw rod;

(e) first clutch means between said duty brake piston and said screw rod for locking said screw rod against rotation upon clutch engagement in response to movement of said duty brake piston in a brake application direction and for unlocking said screw rod upon clutch disengagement in response to movement of said duty brake piston in a brake release direction to thereby free said screw rod to rotate;

(f) means for urging said screw rod and said duty brake piston in said brake release direction;

(g) slack adjuster means for limiting axial displacement of said thrust rod in said brake release direction a predetermined distance, whereby continued axial displacement of said screw rod in said brake release direction corresponding to overtravel of said duty piston during said brake application induces rotation of said screw rod relative to said first nut member in a direction to effect lengthening of the axial dimension between said screw rod and said thrust rod;

(h) a parking/emergency brake piston subject on one side to the force of a spring urging movement thereof in said brake application direction, and subject on the opposite side to the force of fluid pressure normally sufficient to overcome the force of said spring to maintain said parking/emergency brake piston in a brake release position,

(i) a second nut member threadedly disposed on said screw rod for rotation thereon;

(j) second clutch means for inhibiting rotation of said second nut member during movement of said parking/emergency brake piston in said brake application direction to lock said second nut member axially in relation to said screw rod, such that the force of said spring acting through said parking/emergency brake piston is transmitted to said thrust rod, said second clutch means including:

(i) a first sleeve member that is connected to said parking/emergency brake piston in such a manner as to be rotatable relative thereto, said first sleeve member including a force transmitting surface; and

(ii) a force receiving surface formed on said second nut member so as to be engageable with said force transmitting surface upon movement of said parking/emergency

brake piston in said brake application direction to effect said locking of said second nut member;

(k) means for limiting axial movement of said second nut member relative to said parking/emergency brake piston so as to maintain a predetermined spacing between said force transmitting and receiving surfaces irrespective of the stroke of said duty brake piston, whereby the degree of expansion of said parking/emergency brake piston spring and thus the force exerted thereby on said one side of said parking/emergency brake piston is constant for a given reduction of fluid pressure from said opposite side of said parking/emergency brake piston;

(l) third clutch means normally having engagement for rotatably locking said first sleeve member against rotation; and

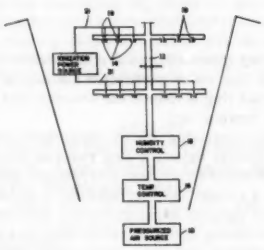
(m) means for effecting disengagement of said third clutch means upon movement of said parking/emergency brake piston in said brake application direction a distance exceeding said predetermined spacing between said force transmitting and receiving surfaces, thereby permitting said second nut member and said first sleeve member to rotate relative to said screw rod under the thrust of said spring, the direction of rotation being such as to permit said parking/emergency brake piston to be moved axially into engagement with an end stop on the casing of said brake cylinder device to thereby cage said spring and accordingly relieve the spring force from said thrust rod.

4,493,247

APPARATUS FOR IMPROVEMENT OF AIR QUALITY IN PASSENGER AIRPLANE CABINS

Mordechai Wachsman, Tel-Aviv, Israel, assignor to Amcor Ltd., Tel-Aviv, Israel

Filed Jun. 14, 1983, Ser. No. 504,264
Claims priority, application Israel, Jul. 12, 1982, 66297
Int. Cl.³ F24F *7/06*
U.S. Cl. 98—1 **11 Claims**



1. Ventilation and air quality treatment apparatus for passenger aircraft comprising:

a source of pressurized air;

a conduit network coupled to said source of pressurized air and to a multiplicity of outlet devices, each of said outlet devices being adapted to be positioned adjacent to an individual passenger location;

said multiplicity of outlet devices each constructed so as to define a pressurized air flow pathway therein; and

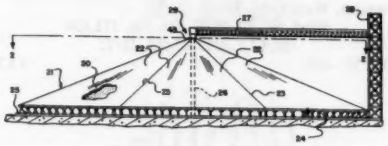
a plurality of individual ionization means each disposed in the air flow pathway of one of said outlet devices for providing ionization of the air passing therethrough.

4,493,248

STORAGE SYSTEM FOR GRANULAR MATERIALS

Paul P. Wolstenholme, c/o Super C Products Company, 229 S. Main St., P.O. Box 36, West Mansfield, Ohio 43358

Division of Ser. No. 395,547, Jul. 6, 1982, Pat. No. 4,454,807.
This application Oct. 17, 1983, Ser. No. 542,339
Int. Cl.³ B65G *3/00*; B65D *88/16*; A01F *25/14*
U.S. Cl. 98—52 **6 Claims**



1. Method of storing a flowable granular material comprising the steps of:

positioning a pluraltiy of mating, flexible and impervious cover sections upon a support surface;

securing said cover sections together to define a cover having a centrally located opening;

grasping said cover in the region of said central opening and lifting the surrounding portion of said cover to a predetermined height; said cover sagging naturally from said height and being free to pull inwardly as necessary to accommodate said lifting;

introducing said granular material into said opening until said granular material comes into contact with said cover;

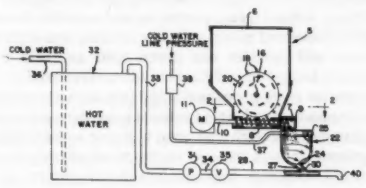
continuing said introduction to cause said granular product to lift said cover and carry it outwardly away from the point of said introduction, thereby defining a pile which extends along a normal angle or repose in an outward and downward direction from the point of said introduction and which is entirely covered by said cover throughout said introduction.

4,493,249

APPARATUS FOR DISSOLVING SOLUBLE COFFEE

Kenneth W. Stover, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Nov. 12, 1982, Ser. No. 440,979
Int. Cl.³ A47J *31/00*
U.S. Cl. 99—275 **6 Claims**



1. Apparatus for dissolving soluble coffee particles in hot water to produce hot coffee beverage comprising, feeding means for discharging a stream of soluble dry coffee particles at a predetermined rate, a mixing receptacle having a bottom discharge opening and wherein said stream of soluble coffee particles is received and mixed with a stream of cool or cold water, means for delivering a stream of cool or cold water to said receptacle at a predetermined rate, a hot water conduit, means for causing a stream of hot water to flow at a predetermined rate in said hot water conduit, and a conduit connection between said bottom discharge opening of said mixing receptacle and said hot water conduit, said mixing receptacle being positioned to receive said stream of soluble coffee particles and having water inlet means adjacent its top which causes the cool or cold water delivered thereto to flow as a vortex-like stream

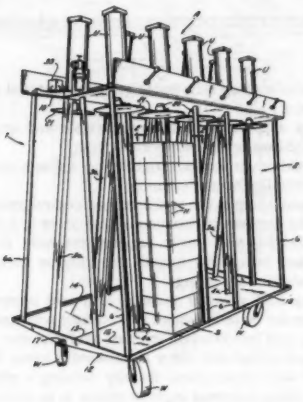
down the inner surface thereof while mixing with said soluble coffee particles, and said stream of hot water flowing in said hot water conduit being of such velocity and volume as to create suction in said conduit connection.

4,493,250

PORTABLE CHEESE PRESS FRAME ASSEMBLY

Gary R. Smith, Watertown, Wis., assignor to Kusel Equipment Company, Watertown, Wis.

Filed Jul. 22, 1980, Ser. No. 171,124
Int. Cl.³ A01J *25/10, 25/15*
U.S. Cl. 99—456 **1 Claim**



1. A portable cheese press frame assembly for being supported on a floor and for removably supporting hoops and for pressing the curd in said hoops to cause draining of the whey therefrom, said assembly comprising a frame including a generally vertical tubular frame member having an upper end and also having a lower end which opens below said hoops and at the lower end of said frame and adjacent said floor, a fluid circuit mounted on the upper end of said frame assembly, said assembly also including gas-operated cylinder and piston units mounted on the top of said frame and including an extensible piston member extending downwardly for pressing the curds in said hoop, control means carried by said assembly for actuating said cylinder and piston units in extending and contracting directions, said cylinder and piston units and said control means being located in said fluid circuit, a valve exhaust line in said circuit for receiving exhaust fluid from said control means, conduit means for discharging exhaust gases from said cylinder and piston units through said control means and through said valve exhaust line and into said upper end of said tubular frame member for discharge from the lower end thereof so as to ensure that said exhaust gases and impurities contained therein will not contaminate said hoops by contact therewith.

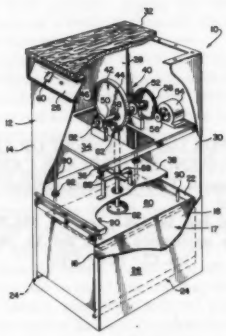
4,493,251

TRASH AND GARBAGE COMPACTOR

Richard Green, 19131 Delaware St. Apt. 18A, Huntington Beach, Calif. 92648

Filed Sep. 29, 1982, Ser. No. 427,913
Int. Cl.³ B30B *1/26*
U.S. Cl. 100—53 **1 Claim**

1. A trash-and-garbage-compactor apparatus comprising:
a housing having an upper portion and a lower portion defined by an intermediate partition and an opening formed in said lower portion of the front wall thereof;
a drawer slidably mounted within said lower portion of said housing so as to be selectively positioned between an open and a closed mode, said drawer defining a refuse receptacle;
means attached to said drawer to allow said drawer to be slidably positioned in either an open or a closed mode;
a frame structure provided within said housing;
cam means supported by said frame structure and positioned in said upper portion of said housing;
a pressure plate attached to said cam means and adapted to be received in said receptacle to compress said refuse disposed therein when said receptacle is in a closed mode; and
drive means mounted in said upper portion of said housing and operably connected to said cam means, wherein rotational movement of said cam means is transferred into an alternating rectilinear movement of said pressure plate;
wherein said cam means comprises:
a cam lobe driven by said drive means, and formed having a cylindrical disc including an annular peripheral ring, said disc being eccentrically attached to said drive means; and
a cam-follower means having one end engaging said annular peripheral ring of said cam lobe, and the opposite end thereof attached to said pressure plate, said cam-follower means comprising a ram rod having an overriding means;
wherein said engaging end of said ram rod comprises:
a yoke member;
a pair of oppositely disposed rollers attached to said yoke member to engage the inner surface of said annular ring on opposite sides of said disc member; and



a roller bearing mounted in said yoke member for engagement with the outer peripheral surface of said ring, whereby said ring is interposed between said rollers and said roller bearing; and
wherein said overriding means comprises said ram-rod which is formed having a first ram-rod member and a second ram-rod member, said first ram-rod member being formed as a tubular member adapted to slidably receive said second ram-rod member therein, and interposing a pre-loaded biasing spring between said first and second ram-rod members, said spring being positioned within said first tubular ram rod member for engagement with said second ram rod member, whereby said second ram rod member can slide within said first ram rod member after said pressure plate is prevented from reaching its downward maximum length of travel;
said pressure plate including a stabilizing means which comprises a plurality of stabilizer rods mounted to said pressure plate adjacent each corner thereof and slidably supported within said intermediate partition;
wherein said drive means comprises:
a motor;
a gear train operably connected to said motor;
a drive shaft rotated by said gear train, said cam lobe being eccentrically mounted to said drive shaft; and

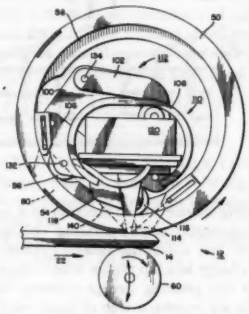
means mounted to said intermediate partition for vertical alignment of said ram rod.

4,493,252

POSTAGE PRINTING APPARATUS HAVING A MOVABLE PRINT HEAD IN A PRINT DRUM

John I. Clark, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 9, 1983, Ser. No. 473,414
Int. Cl.³ B41F *11/00, 13/36*
U.S. Cl. 101—71 **19 Claims**



17. A postage meter printing apparatus for applying postage indicia to a mailpiece comprising:

(a) a rotary operating drum means for feeding the mailpiece through the postage meter, the drum means a nonrotary reciprocating impact matrix print head secured to a stationary support and located within the rotary drum means,

(b) a linkage means which cooperates with the rotary drum means to move the print head between a printing and non-printing position,

(c) means to cycle the drum means and activate the print head,

(d) means for maintaining the mailpiece against the drum means while the print head prints postage on the mailpiece, the means for maintaining being mounted adjacent the drum means, and

(e) means for controlling the means for maintaining including means for pivoting the mailpiece against the print head while printing takes place and to hold the mailpiece clear of the drum means as the mailpiece enters the postage meter before printing takes place.

4,493,253

VARIABLE IMPACT PRINTING MEANS

Arvindkumar C. Vyas, Waterloo, Canada, assignor to NCR Canada Ltee, Mississauga, Canada

Filed Nov. 23, 1983, Ser. No. 554,743
Int. Cl.³ B41J *9/38, 9/42*
U.S. Cl. 101—93.03 **11 Claims**

1. Variable impact printing mechanism comprising in combination:

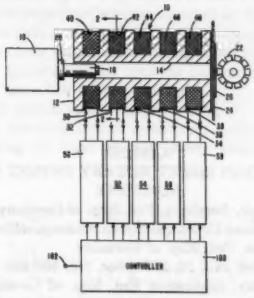
hammer means capable of moving in a generally linear path between a rest position and an operated position in which said hammer means cooperates with said print indicia element to effect printing upon a record medium;

support means capable of defining the path of the hammer means;

a plurality of electromagnetic coil means mounted in operative relation to said support means, each of said coil means being capable of incrementally affecting the movement of said hammer means along said path;

driving means for energizing each of said electromagnetic coil means; and

controller means comprising a microprocessor and look-up table means for controlling said driving means by predetermined control signal combinations in response to input data representing different print requirements to cause



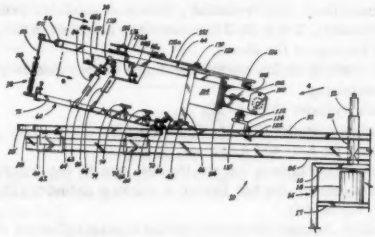
said plurality of electromagnetic coil means to act in combination to move said hammer means along said path at desired velocities, to provide varying printing impact forces in response to varying printing requirements.

4,493,254

SCREEN PRINTING MACHINE AND DRIVE SYSTEM THEREFOR

Benjamin J. Landesman, and David A. Landesman, both of St. Louis, Mo., assignors to Lawson Printing Machines Company, Inc., St. Louis, Mo.

Filed Oct. 31, 1983, Ser. No. 546,879
Int. Cl.³ B41F *15/36, 15/10*
U.S. Cl. 101—123 **15 Claims**



1. In screen printing apparatus for entirely prime mover-driven screen printing of work presented for printing upon a work-receiving table, said apparatus comprising a screen printing unit including a squeegee support frame, a squeegee supported by and movable relative to said squeegee support frame, means presenting said squeegee support frame for pivotal movement in a vertical plane between raised and lowered positions, a screen frame, including a screen, carried by said squeegee support frame for being lowered into a printing position upon said work when said squeegee support frame is lowered, the improvement characterized by drive means including an upstanding drive shaft, a single prime mover for turning said drive shaft, a cam having first and second cam surfaces forming an angle therebetween, cam following means carried at a lower end of said drive shaft for alternately engaging said cam surfaces for causing alternate movement of said squeegee support frame between said raised and lowered positions, a crank at an upper end of said drive shaft swingable around said upstanding drive shaft, and connecting rod means interconnecting said squeegee and crank for reciprocating movement of said squeegee upon rotation of said drive shaft,

whereby said single prime mover produces not only cammed raising and lowering of said squeegee support frame but also said squeegee reciprocating movement.

4,493,255

MULTI-STATION SHEET ROTARY OFFSET PRINTING MACHINE

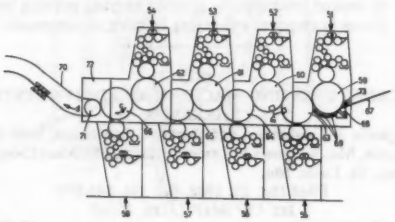
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.—Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,498

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203879

Int. Cl.³ B41F *7/02, 21/10*

U.S. Cl. 101—183 **20 Claims**



1. Sheet-fed rotary offset printing machine system having at least three first essentially identical modular printing stations (1, 2, 3, 4; 51–54) sequentially arranged in the path of feeding of the sheets,

each printing station module forming a unitary assembly and comprising

a plate cylinder (13; 14–16);

a blanket cylinder (17; 18–20; 59; 60–62);

an inker (5; 6–8) and a damper (9; 10–12);

all modular stations, except the last one in the sequential arrangement, further having a printing cylinder (21; 22, 23; 63; 64–66);

in which the axes of rotation of the blanket cylinders of all the modular printing stations are located in a first common plane (A), and the axes of rotation of the printing cylinders are all located in a second common plane (B), parallel to said first plane;

and wherein the blanket cylinders and the printing cylinders include sheet grippers (G);

the printing cylinder (e.g. 22) of any one modular station (e.g. 2) being in engagement with both the blanket cylinder of the station (2) of which it is a part, and with the blanket cylinder (e.g. 19) of an adjacent modular station (e.g. 3);

a theoretical connecting line (C) between the axes of rotation of any blanket cylinder and of the adjacent printing cylinder of the system has a plurality of respectively angled portions or legs defining, together, a zig-zag configuration, the individual portions or legs of which are inclined with respect to each other by an angle (α) of between about 70° to 175°; and

the sheet is transferred from the blanket cylinder of any one station to the blanket cylinder of any adjacent printing station directly by the printing cylinder between the adjacent stations.

4,493,256

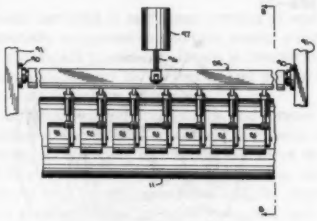
VOLTAGE APPLICATOR FOR LIMITING CHARGE DISTRIBUTION IN ESA PRINTING EQUIPMENT

Bruce E. Hyllberg, Gurnee, and George B. Brands, Wilmette, both of Ill., assignors to American Roller Company, Union Grove, Wis.

Filed Feb. 29, 1984, Ser. No. 584,614

Int. Cl.³ B41F *5/00*

U.S. Cl. 101—216 **9 Claims**



1. A charging device for connection to a voltage source to apply an electrostatic-assist operating voltage across an impression roller and a printing design cylinder to produce an electrostatic charge in a nip region where the impression roller bears against the printing design cylinder and where, in a portion of the nip region, a web of print-receiving material is fed between the impression roller and the printing design cylinder, the charging device comprising:

a plurality of rolling conductive surfaces spaced along the length of the impression roller;

cylindrical core means for supporting the rolling conductive surfaces along the length of the impression roller, the cylindrical core means having electrically conductive journal shafts for connection to the voltage source; and

electrical connecting means coupled to the cylindrical core means for connecting selected ones of the rolling conductive surfaces in an electrical circuit between a first one of the journal shafts and the impression roller to couple the electrostatic-assist operating voltage to a portion of the impression roller contacted by the selected ones of the rolling conductive surfaces and to concentrate electrostatic charge in a corresponding portion of the nip region.

4,493,257

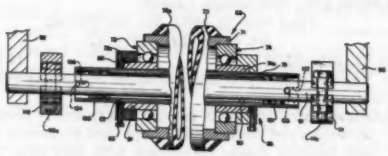
INKER FOR A PRINTING PRESS

Vincent T. Kubert; John C. Frampton, and George Y. Ono, all of Arlington, Tex., assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 25, 1983, Ser. No. 545,177

Int. Cl.³ B41F *31/14;* B41L *27/16*

U.S. Cl. 101—349 **10 Claims**



1. An inker for applying ink to a lithographic printing plate having ink-respective and ink-rejecting areas, certain of said ink-receptive areas which are to print substantially the same color as the other of said ink-receptive areas being disposed in axially adjacent circumferential sections of the printing plate, which circumferential sections have different percentages of ink-receptive areas, said apparatus comprising a form roll having a cylindrical outer surface, means for applying an ink film to the entire cylindrical outer surface of said form roll,

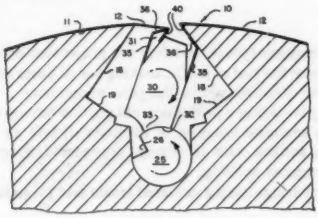
means for supporting said form roll so that said cylindrical outer surface has an ink-transferring engagement with the printing plate, and means for promoting the application of a smooth coating of ink to axially adjacent circumferential ink-receptive sections of the printing plate, said means for promoting the application of a smooth coating of ink including means for moving said form roll axially while the form roll is in said ink-transferring engagement with the printing plate to present ink from different axial portions of the form roll to the same circumferential section of the plate, a form roll shaft fixed against rotation about its own axis, a member extending along said shaft and axially slidable relative to said shaft, a pair of bearings interposed between said member and said form roll and supporting said form roll for rotation about said shaft, and means for clamping at least a part of said bearings to said member for axial movement along said shaft upon axial movement of said form roll.

4,493,258

INTERFACING CAM AND TOGGLE LOCKUP

Alan R. Wallschlaeger, Marion, and John F. Wade, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1983, Ser. No. 551,526
Int. Cl.³ B41F *27/12*
U.S. Cl. 101—415.1 **3 Claims**



1. A plate clamping arrangement for a reversible printing cylinder comprising in combination: A plate roll for receiving a flexible printing plate having mounting tangs on each end thereof, said roll having a longitudinal groove formed thereof; a bottom surface in said groove having a circular radius of curvature; sidewalls in said groove defining a volume greater than the volume defined by said bottom surface; a circular cam situated within said plate roll groove, said circular cam having an arcuate surface with a radius of curvature substantially equal to the radius of curvature of said bottom surface, said arcuate surface mating with said bottom surface, said cam having a groove running along the length thereof; a bar-like toggle situated within the groove of said plate roll, said bar-like toggle having a pair of lower surfaces that mate with the arcuate surface of said cam; and a generally U-shaped spring mounted on said toggle having upper free ends for engaging a plate to hold it in position on said roll.

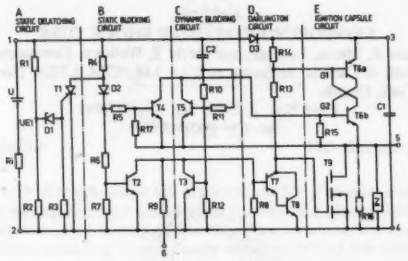
4,493,259

CONTROL CIRCUIT FOR IGNITING A LOW-OHM IGNITION CAPSULE

Klaus Münzel, Klingnau, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,238
Claims priority, application Switzerland, Sep. 24, 1981, 6153/81
Int. Cl.³ F42C *11/06*
U.S. Cl. 102—218 **6 Claims**

1. A control circuit for igniting a low-ohm ignition capsule, comprising:
a voltage source;
power switch means connected in circuit with said low-ohm ignition capsule;
an ignition capacitor connected in circuit with said voltage source and chargeable by means of said voltage source;
said ignition capacitor being connected in circuit with said power switch means and with said ignition capsule;
a static blocking circuit for exerting a blocking action preventing ignition of the ignition capsule as long as the ignition capacitor is being charged;
said power switch means having a base;
said static blocking circuit containing a first transistor for connecting the base of said power switch means with ground;



a static delatching circuit which eliminates the blocking action of the static blocking circuit as soon as the ignition capacitor has been charged;
said static delatching circuit containing a Zener diode for disconnecting said static blocking circuit as soon as the voltage of the ignition capacitor has reached a threshold voltage of said Zener diode;
a dynamic blocking circuit for preventing an unintentional ignition of said ignition capsule during the intentional charging of the ignition capacitor upon malfunction of said ignition capacitor; and
said dynamic blocking circuit containing a capacitor.

4,493,260

ANNULAR SHAPED CHARGE FOR BREACHING MASONARY WALLS

John S. Foster, Richmond, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1983, Ser. No. 549,841
Int. Cl.³ F42B *1/02*
U.S. Cl. 102—307 **4 Claims**

1. A device for breaching masonary walls comprising:
a symmetrical container for insertion into a pilot hole in the wall having a first cylindrical cavity portion disposed at one end, a second cylindrical cavity portion disposed at a second end, and a third cavity portion disposed midway between said first and second cavity portions the shape of

the third cavity portion being defined by an annular concave portion of said container extending into said third cavity portion and defining a shaped charge liner adapted to collapse, invert, fragment, and create a jet of annular radially expandable fragments and explosive gases;

an explosive filling said cavity portions presenting two exposed surfaces at the first and second cavity portions for generating the explosive gases and a force for collapsing, inverting, and fragmenting the concave shaped charge liner; and, simultaneous detonation means associated with the explosive surfaces for simultaneous initiating detonation of said explosive in the first and second cavity portions.

4,493,261

REINFORCED EXPLOSIVE SHOCK TUBE

James R. Simon, Lachute, and David J. Welburn, Brownsburg, both of Canada, assignors to CXA Ltd./CXA LTEE, North York, Canada

Filed Nov. 2, 1983, Ser. No. 547,861
Int. Cl.³ F42D *3/00*
U.S. Cl. 102—331 **6 Claims**

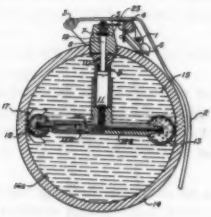
1. A low energy explosive shock tube comprising a bonded, two-ply, inner and outer layer plastic tube, the inner layer having high adhesion properties for a thin layer of powdered energy-producing material distributed on its inner surface and the outer layer having high resistance to mechanical damage and a plurality of lengthwise textile filaments of low elongation properties bonded at the interface of the said inner and outer tube layers.

4,493,262

FUEL AIR EXPLOSIVE DEVICE

Don S. Hutcheson, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1982, Ser. No. 438,683
Int. Cl.³ F42B *27/00*; F42C *15/02*
U.S. Cl. 102—363 **11 Claims**



1. A device adapted to explode a fuel air mixture comprising:

a container having a casing enclosing a liquid fuel for defining an explosive when mixed with air, and

a detonator and burster disposed within the container, said burster upon firing being adapted to burst the casing and force the fuel upward and outwardly to form a cloud of fuel air mixture;

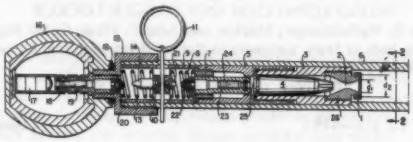
wherein the burster and detonator are emersed in the liquid fuel with a plunger-striker means, and when the plunger-striker means is released the burster is positioned at the bottom of the liquid fuel and the cloud detonator is positioned at the top of the fuel level in the container prior to firing.

4,493,263

BALLISTIC PROPULSION SYSTEM

Eustratios N. Carabateas, 10, Chlois Str., Kiffisia, Greece

Filed Sep. 29, 1982, Ser. No. 426,613
Claims priority, application Greece, Nov. 16, 1981, 66532
Int. Cl.³ F42B *27/00, 13/28*
U.S. Cl. 102—483 **8 Claims**



1. A propulsion system and fuse for projectiles of the type launched from the end of a rifle, making use of gases generated by a ballistic cartridge within the rifle, comprising:

a housing including a propulsion tail portion having a nozzle with a rearmost opening of diameter d_1 and an annular seating surface with an outside diameter d_2 surrounding said rearmost opening;

ballistic cartridge means mounted inside said propulsion tail; and

diaphragm means mounted over said rearmost opening in contact with said seating surface, said diaphragm means being constructed to break away from said propulsion tail under the pressure of gases produced by the ballistic cartridge means mounted therein over an area having a diameter at least as great as d_2, said diaphragm means being also constructed to remain intact under pressures produced over a surface area having a diameter at least as small as d_1, said diaphragm means remaining intact and being forced against said seating surface under pressures produced by the ballistic cartridge within said rifle to achieve an initial propulsion of said projectile, said diaphragm means being broken away under the influence of gases produced by the ballistic cartridge within said propulsion tail, whereby additional propulsion of said projectile is produced.

4,493,264

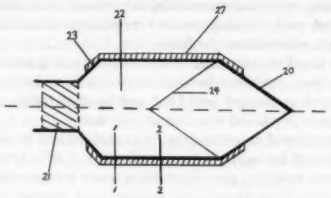
ELASTIC FRAGMENTATION SLEEVE

Robert L. Jameson, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1982, Ser. No. 453,670
Int. Cl.³ F42B *13/18, 1/02*
U.S. Cl. 102—491 **5 Claims**

1. In an improved device for use to augment the fragmentation of a high-explosive anti-tank missile having a body, the

improvement consisting essentially of a light-weight, hand-carried elastic base sleeve for use in the field to snugly and separably cover said body of said missile, a plurality of metal fragments, and means for adhering said fragments to said sleeve.

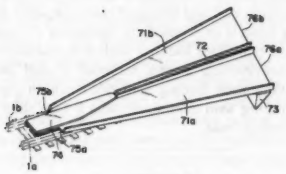


4,493,265

ELECTRIC RERAILER FOR A MODEL RAILWAY

Fukushiro Miura, 15-2 Moegino, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jun. 21, 1982, Ser. No. 390,673
Claims priority, application Japan, Dec. 29, 1980, 55/185419
Int. Cl.³ B61K *5/06*; A63H *18/12*
U.S. Cl. 104;269 **8 Claims**



1. A rerailer adapted to allow a model motor-driven vehicle having an electric motor which is provided electric power via a pair of electrically-conductive wheels to become properly disposed on a pair of spaced-apart electrically-conductive rails so that a large diameter section of each wheel is adjacent an inner side of a respective one of the rails, the rerailer comprising:

(a) a rerailer base;

(b) a first conductor disposed on said rerailer base and having a first end and a second end, said first conductor having a flat electrically-conductive upper surface with a width tapering from said second end to said first end, said first end of said first conductor disposed adjacent to and in electrical contact with a first one of said pair of rails;

(c) a second conductor disposed on said rerailer base and having a first end and a second end, said second conductor having a flat electrically-conductive upper surface with a width tapering from said second end to said first end, said first end of said second conductor disposed adjacent to and in electrical contact with a second one of said pair of rails;

(d) insulating means disposed on said rerailer base and disposed between said first conductor and said second conductor for electrically insulating said first conductor from said second conductor; and

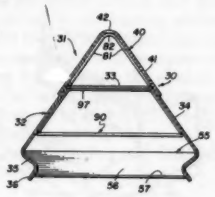
(f) guide means disposed on said rerailer base and disposed along said upper surface of said first conductor for guiding a first wheel of said pair of wheels along said upper surface of said first conductor and onto one of the pair of rails, and disposed along the upper surface of said second conductor for guiding a second wheel of said pair of wheels along the upper surface of said second conductor and onto the other of the pair of rails as the vehicle powered by the electric motor moves from said second ends to said first ends of said first and second conductors.

4,493,266

RAILWAY HOPPER CAR AND CENTER SILL CONSTRUCTION THEREFOR

Paul C. Augustine, Jr., Butler, Pa., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Jun. 1, 1982, Ser. No. 383,819
Int. Cl.³ B61D *7/08*, *17/00*; B61F *1/00*
U.S. Cl. 105—255 **30 Claims**



1. A through center sill construction for a railway hopper car having draft and coupling mechanisms at each end thereof, said center sill construction comprising an elongated central section extending longitudinally of the associated car substantially from one of the draft and coupling mechanisms to the other and being substantially A-shaped in transverse cross section, said central section including an upper part having a transverse cross section substantially in the shape of an inverted V and a lower part having a transverse cross section generally in the shape of an open-bottom trapezoid, each of said upper and lower parts having a pair of upwardly converging inclined side walls, the side walls of said upper part being disposed in parallel integral relationship respectively with the side walls of said lower part, and two end sections respectively coupled to said central section at the opposite ends thereof for respectively housing the associated draft and coupling mechanisms.

19. A railway hopper car comprising a car body defining a plurality of hoppers therein; draft and coupling mechanisms coupled to said car body at each end thereof; and a through center sill construction extending throughout the length of said car body, said center sill construction including an elongated central section extending substantially from one of said draft and coupling mechanisms to the other, and being substantially A-shaped in transverse cross section, said central section extending upwardly into said hoppers and being positioned to shed associated lading, and two end sections respectively coupled to said central section at the opposite ends thereof for respectively housing said draft and coupling mechanisms.

24. A railway hopper car comprising a car body defining a plurality of hoppers therein; draft and coupling mechanisms coupled to said car body at each end thereof; and a through center sill construction extending throughout the length of said car body, said center sill construction including an elongated central section extending substantially from one of said draft and coupling mechanisms to the other, said central section being substantially A-shaped in transverse cross section and including sloping side walls converging upwardly to an apex and a horizontal wall interconnecting said side walls intermediate the upper and lower ends thereof and separating said central section into upper and lower portions, said apex of said central section extending upwardly into said hoppers and being positioned to shed associated lading, two end sections respectively coupled to said draft and coupling mechanisms for housing same, and two transition sections respectively coupled to the opposite ends of said central section, each of said transition sections including a transition member connected to the adjacent end section and to said lower portion of said central section and two reinforcing members respectively overlying and underlying said transition member and connected thereto

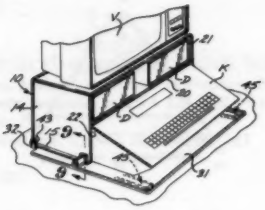
and to said central section and to the adjacent one of said end sections.

4,493,267

SECURABLE STORAGE ASSEMBLY FOR DATA PROCESSING DEVICE

Francis J. Jedziniak, 2352 W. 227th St., Torrance, Calif. 90501

Filed Jan. 18, 1982, Ser. No. 340,115
Int. Cl.³ G06C 7/02
U.S. Cl. 108—50 3 Claims



1. A storage system for storing a complement of data processing devices comprising:

a slidably mounted support plate;

a shelf unit pivotally mounted on said support plate, said shelf unit including a bracket formed as an inverted U-shaped structure having vertical surfaces joined by a horizontal panel and a shelf attached below said horizontal panel, said shelf and bracket cooperating to form an upper and lower cavity conformed to receive data processing devices;

pivot means connected between said support plate and the free ends of said vertical panels for providing pivotal articulation of said shelf unit relative said support plate; and

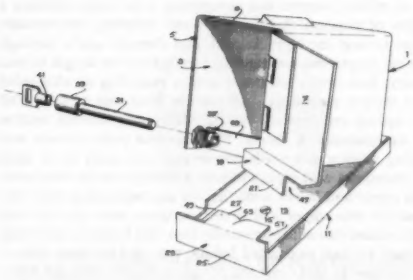
lock means for selectively engaging said shelf unit to said support plate and for restraining said unit against pivotal movement relative said support plate.

4,493,268

SAFE KEEPING BOX ASSEMBLY

Karl Sidler, 420 Touzin Ave., Dorval, Quebec, Canada H9S 2N2

Filed May 10, 1983, Ser. No. 493,241
Int. Cl.³ E05G 1/04
U.S. Cl. 109—52 10 Claims



1. A safety box assembly comprising:

(a) a container defining an enclosure for the safekeeping of valuables and having wall edges at one end defining an opening;

(b) a door hinged to said container for closing said opening;

(c) a mounting base having a bottom wall and means for fastening the bottom wall to a supporting surface;

(d) means to removably secure said container on said mounting base over said fastening means whereby to render said fastening means inaccessible, when said container is so secured, said securing means comprising, when said container is secured on the base;

a first bracket at the end of said door adjacent said mounting base, said first bracket having a door locking wall extending toward said base and located inside said enclosure in closed position of said door;

a second bracket upstanding from said bottom wall of said base and including a front wall closing off a lower part of said opening and disposed in space relationship with said door locking wall; said second bracket further including a container locking wall extending over and above said bottom wall between said door locking wall and said container locking wall; said door locking wall, said container locking wall and said front wall defining a locking area;

a locking rod slid into said locking area;

means on two opposed ones of said container wall edges to hold and releasably lock said locking rod within said locking area, and

releasable interlocking means at the end of said container away from said opening and at the corresponding end of said mounting base to hold said container end on said mounting base;

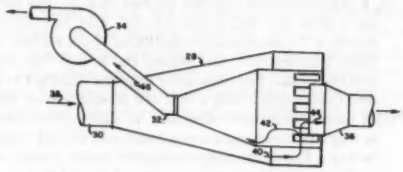
whereby with said locking rod in said locking area, opening of said door is prevented by abutment of said door locking wall against said locking rod and lifting of said container away from said mounting base is prevented by abutment of said locking rod against said container locking wall and operative engagement of said interlocking means, removal of said locking rod from said locking area freeing said door which can then be opened and freeing said container which can then be lifted from said mounting base.

4,493,269

DIRECT PULVERIZED FUEL FIRED SYSTEM

Richard L. Musto, Homewood, Ill., and Norichika Kai, San Paulo, Brazil, assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 442,558, Nov. 18, 1982,. This application Dec. 23, 1983, Ser. No. 564,661
Int. Cl.³ F23K 1/00
U.S. Cl. 110—106 4 Claims



1. In a direct fired system operative for purposes of effecting the pulverization and subsequent firing of solid fuels, said direct fired system including pulverizer means for pulverizing solid fuel material, classifier means for rejecting pulverized solid fuel particles that exceed preset specifications for fineness and for returning the rejected oversize particles to the pulverizer means for further pulverization, burner means for firing therewithin properly sized solid fuel particles, and means establishing a fluid flow path for a stream of hot gases and for the pulverized solid fuel particles from the pulverizer means to the classifier means and from the classifier means to the burner means, the improvement comprising classifier means consisting of a double cone classifier including a cone section, recirculation means having one end thereof positioned centrally of said cone section so as to be connected in fluid flow relation there-

with and having the other end thereof connected to the pulverizer means, said recirculation means including a receiver hood supported adjacent said cone section of said double cone classifier for receiving a portion of the stream of hot gases that enters said double cone classifier and that upon exiting from said double cone classifier has entrained therein the rejected oversize particles, said recirculation means further including a dust handling fan supported in mounted relation along the length of said recirculation means intermediate the ends thereof, said dust handling fan being operative to recirculate from said receiver hood directly back to the pulverizer means a portion of the stream of hot gases that enters said double cone classifier and that when received by said receiver hood has entrained therein the rejected oversize particles, said dust handling fan thereby effectuating the return of the rejected oversize particles to the pulverizer means for further pulverization therewithin while concomitantly preventing the circulation from said double cone classifier to the burner means of the entire stream of hot gases that enters said double cone classifier so as to improve the combustion ratio of solid fuel particles to hot gases at the burner means.

3. In a direct fired system operative for purposes of effecting the pulverization and subsequent firing of solid fuels, said direct fired system including pulverizer means for pulverizing solid fuel material, classifier means for rejecting pulverized solid fuel particles that exceed preset specifications for fineness and for returning the rejected oversize particles to the pulverizer means for further pulverization, burner means for firing therewithin properly sized fuel particles, and means establishing a fluid flow path for a stream of hot gases and for the pulverized solid fuel particles from the pulverizer means to the classifier means to the burner means, the improvement comprising classifier means consisting of a double cone classifier including an outlet portion, recirculation means connected at one end of fluid flow relation to said outlet portion and connected at the other end to the pulverizer means, said recirculation means including a dust handling fan supported in mounted relation along the length of said recirculation means intermediate the ends thereof, said dust handling fan being operative to recirculate from said outlet portion directly back to the pulverizer means a portion of the stream of hot gases that enters said double cone classifier and that upon exiting from said outlet portion of said double cone classifier has entrained therein the rejected oversize particles, said dust handling fan thereby effectuating the return of the rejected oversize particles to the pulverizer means for further pulverization therewithin while concomitantly preventing the circulation from said double cone classifier to the burner means of the entire stream of hot gases that enters said double cone classifier so as to improve the combustion ratio of solid fuel particles to hot gases at the burner means.

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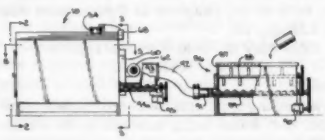
HEATING UNIT

Arthur P. Gamroth, 1055 S. Barker Rd., Waukesha, Wis. 53186

Filed Nov. 10, 1983, Ser. No. 550,500
Int. Cl.³ F23N *5/18*
U.S. Cl. 110—188 **18 Claims**



1. A heating unit which comprises:

A combustion chamber having an opening therein for admitting fuel into said combustion chamber;

a perforated burning platform disposed within said combustion chamber and spaced apart from the bottom of the combustion chamber for supporting fuel thereon;

first air forcing means carried in part by said combustion chamber for forcing air into the space beneath the burning platform where it flows upwardly through said perforated burning platform to achieve combustion of the fuel supported thereby;

second air forcing means including a perforated plenum which is positioned above the burning platform and spaced apart from the top of the combustion chamber, said second air forcing means being operable to direct air through said perforated plenum and downward against the fuel supported by said burning platform;

an exhaust outlet formed in the top of said combustion chamber and communicating with the space above said perforated plenum for dispelling the gaseous combustion by-products forced therethrough from the combustion chamber by the pressure of air forced by said first and second air forcing means; and

a heat exchanger surrounding said combustion chamber for recovering heat.

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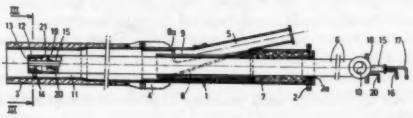
COAL OR MULTIFUEL BURNER

Gérard Ohayon, Loriol; Bernard Reverchon, Bouc Bel Air; Bernard Tourre, Ensues-la-Redonne, and Serge Vigier, Sausset-les-Pins, all of France, assignors to Lafarge Conseils et Etudes, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,417
Claims priority, application France, Feb. 22, 1982, 82 02891
Int. Cl.³ F23K *5/00*
U.S. Cl. 110—262 **1 Claim**



1. A burner for use with pulverized solid fuels, said burner comprising a cylindrical tube through which an air/fuel mixture is ejected into the flame, characterized in that a coaxial cylindrical part is movably mounted within said cylindrical tube, the passageway for the air/fuel mixture consisting of the annular space between said cylindrical tube and said coaxial cylindrical part, said cylindrical part being movably axially from a position in which its outermost end lies adjacent to the outermost end of said cylindrical tube to a retracted position in which its outermost end lies inwardly relative to the outermost end of said cylindrical tube, whereby to permit adjustment of the axial momentum of a gas stream flowing through said burner, means for obliquely introducing the air/fuel into said cylindrical tube at a point remote from the outermost end thereof, said coaxial cylindrical part being provided with a shield in the area where the air/fuel mixture is introduced into said cylindrical tube, whereby to protect the cylindrical part from erosion by the particles of said solid fuel, a closed chamber positioned to the rear of the point where the air/fuel mixture is introduced, said chamber being bounded at one end by an end wall fitted with a snuffing box for the cylindrical part and at its opposite end by an inner wall through which the cylindrical part passes, means for placing said chamber under excess pressure, said inner wall being positioned essentially just behind the point at which the air/fuel mixture is introduced and forms an angle of not more than 10° with respect to the path of travel of the air/fuel mixture as it enters the cylindrical tube, said protective shield and said inner wall being carried by a supporting part fitted within the cylindrical tube and positioned to protect the inner surface of the cylindrical tube from erosion by the particles of fuel, said cylindrical part being provided with means for imparting rotational movement to a

gas passing therethrough, together with a nozzle for injecting a liquid fuel, said cylindrical part being provided with a detachable blocking means adjacent its outermost end, said detachable blocking means being slidably mounted for movement relative to the nozzle for ejecting a liquid fuel, said cylindrical part having a frustoconical surface positioned to be engaged and closed by the blocking means when displaced toward the outermost end of the cylindrical part, thereby blocking the flow of gas through the cylindrical part.

4,493,272

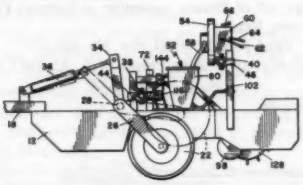
AGRICULTURAL PLANTER WITH SLED FRAME, VACUUM DISPENSING AND GROUND DRIVE

Louie M. Rouhotas, Sr., 673 Sycamore Dr., Brawley, Calif. 92227

Continuation of Ser. No. 931,185, Aug. 4, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,671

Int. Cl.³ A01C *5/06, 7/04, 7/20*

U.S. Cl. 111—59 **11 Claims**



1. An agricultural seed planting implement comprising in combination:

a frame, said frame including connecting means for connecting said frame to a tractor for movement therewith and a first tool bar extending transverse to the axis of movement of the frame,

an elongated jack shaft rotatably mounted on said frame and extending parallel to the tool bar,

ground drive means for driving the jack shaft proportional to the rate of movement of the implement over the ground,

seed distributor means detachably mounted on said tool bar including a vacuum metering device driven by said jack shaft for distributing seeds at selected spacings,

a vacuum fan in a position remote from said connecting means mounted on said frame for controlling the vacuum in said metering device,

and

hydraulic motor means mounted on said frame and driven by the hydraulic system of the tractor driving said vacuum fan wherein said distributor means includes a generally horizontally extending elongated frame having a forward end and a rearward end, and a pair of shanks fixed to and extending upward at a fixed angle from the forward end of said elongated frame for releasably and vertically adjustably connecting to said tool bar for supporting said elongated frame on said tool bar for movement as a unit therewith,

a seed hopper mounted on the top of said elongated frame, said vacuum metering device mounted on and beneath the elongated frame for receiving seeds from said hopper, and

a seed planting shoe mounted on and extending beneath and forward of said elongated frame, and said distributor means moveable as a unit with said first tool bar.

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PLANTING ASSEMBLY

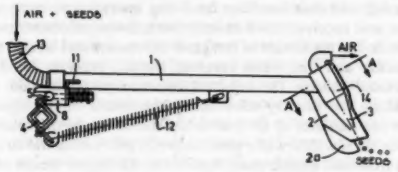
Yves M. A. Ganchet, and Pierre G. Pailland, both of Montereau, France, assignors to Nodet-Gougis, Montereau, France

Filed Oct. 29, 1982, Ser. No. 437,802

Claims priority, application France, Nov. 18, 1981, 81 21609

Int. Cl.³ A01C *5/00, 7/20*

U.S. Cl. 111—86 **2 Claims**



1. In a planting assembly having a frame fixedly mounting a cross-member carrying a horizontal pivot pin entending perpendicular to the direction of movement of the planting assembly, a tubular support arm for a plowshare and for pneumatically conveying seeds to be planted pivotally mounted at its front end to said horizontal pivot pin, a plowshare carried at the rear end of said support arm, the interior of the front end of said support arm being connected to means for supplying a stream of entraining compressed air and seeds, the interior of the rear end of said support arm being connected to a cyclone separator for separating the seeds from the stream of entraining compressed air, the cyclone separator having a lower end which is part of a conduit for planting seeds in a furrow cut by the plowshare, and resilient return means acting in a vertical plane to exert a substantially constant force against the plowshare to drive it into the ground, the improvement comprising:

a U-shaped yoke fixedly secured to the front end of said support arm, said yoke having a central portion and a pair of open-ended slotted legs positioned to engage said horizontal pivot pin to permit pivoting movement of said support arm in a vertical plane and permit lateral rocking of the support arm in a horizontal plane,

a rod slidably received in the central portion of said yoke, said rod terminating at one end in an eye surrounding said horizontal pivot pin with a clearance sufficient to permit lateral rocking of said support arm,

a coil spring surrounding said rod and extending between the central portion of said yoke and a stop at the opposite end of said rod, said coil spring acting to bias the slotted legs of said yoke into engagement with said horizontal pivot pin under a predetermined force, said coil spring permitting lateral rocking movement of said yoke relative to said horizontal pivot pin when said support arm is subjected to a lateral force exceeding the predetermined force of said coil spring.

4,493,274

FURROW FORMING APPARATUS FOR A SEED PLANTER

Edward L. Robinson, Jr., Naperville, and Tom G. Stamp, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 28, 1980, Ser. No. 153,974

Int. Cl.³ A01C *5/06*

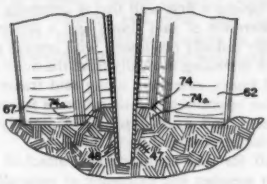
U.S. Cl. 111—88 **9 Claims**

1. A furrow forming apparatus for a seed planter comprising:

(a) a frame, said frame being adapted to be attached for towing to a mobile power source;

(b) a pair of opposed, furrow forming disks rotatably mounted on said frame, with the disks substantially contacting each other at the approximate point of entry into the soil and diverging apart rearwardly and upwardly relative to the direction of travel; and

(c) a pair of gauge wheels mounted on said frame for regulating furrow depth, each wheel being located adjacent an outer surface of a disk and rotatably mounted on an axis rearward of the disk axis of rotation and including means



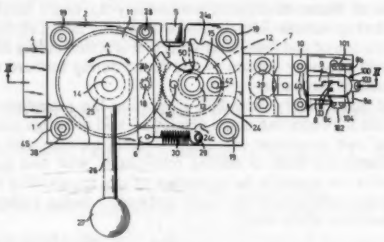
inward the outer periphery of the wheel and located immediately adjacent the disk to trap therebetween soil from the furrow to form a mound of soil along the upper edge of the furrow above the imprint of the wheel in the soil.

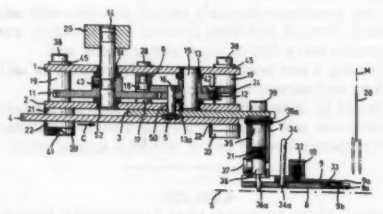
4,493,275

SEWING-MACHINE ATTACHMENT

Albert J. Fischer, Jewett City, Conn., assignor to William Prym Werke KG, Stolberg/Rheinland, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,586
Int. Cl.³ D05B *3/18*
U.S. Cl. 112—105 **13 Claims**





1. An attachment for a sewing machine provided with a vertically reciprocable upright needle that is limitedly oscillatable in a vertical plane, relatively to a work table, about a midposition above said work table, comprising:

a base disposed at a fixed distance from said midposition;

a support on said base engageable with a fabric on said work table and with a finding on said fabric to be stitched thereto at a plurality of spaced-apart locations lying on a common circle, said support being displaceable in a horizontal plane along an arcuate path including a like plurality of working positions in which respective formations of a finding engaged by said support are aligned with said midposition for penetration by said needle; and

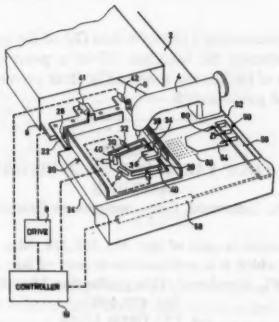
operating means coupled with said support by positively guided link means for displacing same parallel to itself along said path.

4,493,276

POCKET SETTER UNIT AND AUTOMATIC SEWING MACHINE INCLUDING SAME

Yaacov Sadeh, Beersheva, Israel, assignor to Beta Engineering & Development Ltd., Beersheva, Israel

Filed Jul. 22, 1982, Ser. No. 400,713
Claims priority, application Israel, Sep. 29, 1981, 63930
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **4 Claims**



1. A sewing machine including: a main frame; a sewing head mounted thereon; a carriage displaceable with respect to said sewing head a loading table laterally of said sewing head; a pocket setter attached to said carriage to be displaced thereby with respect to the sewing head; said pocket setter including a holder for holding the pocket over the garment to which the pocket is to be fixed; said holder including means defining a free space around the portion of the pocket to be stitched to the garment, and a plurality of folding blades disposed around said free space, each of said folding blades including an actuator for moving the respective blade from a retracted position along one side of said free space, to an extended position in said free space so as to fold under the respective edge of the pocket and to enable the sewing head to apply stitching through the folded edges in said free space for sewing the pocket to the garment; a transfer device for transferring the unstitched pocket and the underlying garment laterally from said loading table to said pocket setter; said transfer device including a templet for receiving the pocket over the garment and for conveying both the pocket and the garment to said pocket setter unit; and a program controller controlling said carriage drive, said transfer device, said actuators for the folding blades of the pocket setter and said sewing head, all according to a selected stored program.

4,493,277

WORKPIECE POSITIONER FOR SEWING UNITS

Roberto Sanvito, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

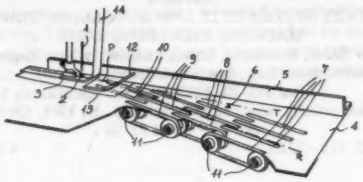
Filed Sep. 30, 1983, Ser. No. 537,768
Claims priority, application Italy, Jul. 4, 1983, 21456/83[U]
Int. Cl.³ D05B *35/10*
U.S. Cl. 112—153 **3 Claims**

1. A workpiece positioner device for sewing units having a sewing machine with a presser foot and a stitching needle defining the unit's sewing zone, said workpiece positioner device comprising:

(a) a feed table (4) mounted on the sewing unit upstream of the sewing zone;

(b) a vertical guide wall (5) mounted on said feed table for guiding a workpiece along a line of feed extending parallel therewith; and

(c) a series of overlapping interfitting drive elements each having a portion of its periphery protruding beyond the upper surface of said feed table and located to move the



workpiece along a line of action (R) of the drive elements encountering the feed line (T) at a point (P) lying upstream of the sewing zone and in close proximity with the vertical guide wall 5.

4,493,278

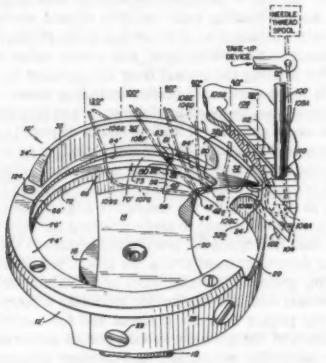
ROTARY LOOP TAKER FOR LOCK-STITCH SEWING MACHINE

Paul Badillo, Lakewood, Colo., assignor to Bakron Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 355,228, Mar. 5, 1982, abandoned, which is a continuation-in-part of Ser. No. 292,036, Aug. 11, 1981, abandoned. This application May 31, 1983, Ser. No. 499,460

Int. Cl.³ D05B *57/08*

U.S. Cl. 112—184 **20 Claims**



1. A rotary loop taker for rotation about a generally cylindrical bobbin case maintained in a substantially fixed position in a lock-stitch sewing machine below the take-up device of said machine, in which sewing machine the needle provides one of the two threads that form said lock-stitch, said needle thread being taken off the needle in the form of a loop by the loop seizing point of said rotary loop taker as the loop taker rotates about the bobbin case, the vertical midsection of the side wall of said bobbin case carrying a radially extending rib for engaging the loop taker as the latter rotates about said bobbin case, which comprises:

(a) a frame of substantially annular construction, said frame having a cut-away portion along one segment of its circumference to provide space for the needle thread to exit from the loop seizing point of the rotary loop taker as said thread is pulled off the loop seizing point by the take-up device, said cut-away portion being defined by opposing end walls of said frame facing upon said cut-away portion;

(b) a frame support member extending crosswise of said substantially annular frame, with one edge portion of said crosswise extending support member facing said cut-away portion of said frame,

said one edge portion of said crosswise extending support member and the one of said frame end walls that is at the trailing end of said cut-away portion during forward rotation of said frame defining a lug-receiving notch, said notch having a first wall that is generally parallel to the circumference of said frame and a second wall that is generally radially positioned with respect to said frame,

said notch extending inwardly from the outer circumference of said frame, extending along said frame in an angular direction opposite to the direction of forward rotation of the frame, and extending axially entirely through said crosswise extending support member;

(c) a shaft for said annular frame attached to said frame support member and extending at generally right angles thereto for rotating said frame about said bobbin case in a predetermined plane during operation of said sewing machine;

(d) a detachable loop seizing point mounted on said frame having generally the same curvature as said substantially annular frame, said detachable loop seizing point:

(i) being integrally formed from one end to its other end,

(ii) having a single continuously tapered, smoothly shaped, integrally formed forward end, said tapered forward end having its largest transverse dimensions in a base portion and tapering to its smallest transverse dimensions at its free end,

(iii) having a supporting lug that extends directly downward into said cut-away portion of said frame from immediately behind said base portion of said tapered forward end, the rearwardly facing surface of said supporting lug abutting at all times, throughout substantially the entire height of the lug, substantially the entire forwardly facing surface of the one of said frame end walls that is at the trailing end of said cut-away portion of said frame during forward rotation of the frame,

said downwardly extending supporting lug extending into said lug-receiving notch defined by said one edge portion of said crosswise extending support member and said frame end wall, in nesting relationship with said notch, with the inwardly facing surface of said lug abutting at all times substantially the entire outwardly facing surface of said first notch wall,

said tapered forward end extending forwardly of said downwardly extending supporting lug into said cut-away portion of said frame,

said lug forming a smoothly curved junction with said tapered forward end base portion, said smoothly curved junction being free of any joints or seams; and

(iv) having a rear portion extending rearwardly of said lug along said annular frame; and

(d) means for detachably securing said loop seizing point to said frame, said means being located entirely rearward of said tapered forward end of said loop seizing point.

4,493,279

COMBINATION NEEDLE AND ACCESSORY DRIVING STUD

Charles R. Odermann, Montville, N.J., assignor to The Singer Company, Stamford, Conn.

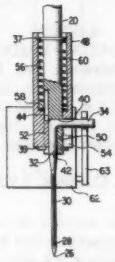
Continuation of Ser. No. 309,297, Oct. 7, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 550,722

Int. Cl.³ D05B *69/02, 85/02*

U.S. Cl. 112—220 **2 Claims**

1. A needle for a household sewing machine having a frame supporting a loop taker supported by said frame for cooperation with said needle in the formation of stitches, and an endwise reciprocable needle bar having an axial bore extending a distance along the length of said needle bar from one end thereof and a slot at least the length of said axial bore and extending into said needle bar to said axial bore, said axial bore terminating at a transverse bore extending through said needle

bar from said axial bore to the opposite side of said needle bar from said slot, and means supported by said needle bar for retaining said needle affixed thereto for cooperation with said loop taker in the formation of stitches, said needle comprising in a unitary construction; an elongated blade portion terminating at one end in a point; a thread carrying eyelet extending through said blade adjacent said point; said blade portion merging to a shank; said shank terminating in an elongated locator portion extending transversely of said shank, said shank



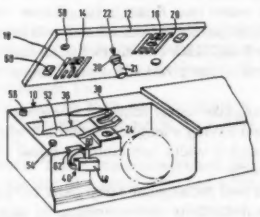
and said locator portion adapted to pass through said slot of said needle bar with said shank to be received in said axial bore and said elongated locator portion to be received in said transverse bore of said needle bar so as to facilitate insertion of said sewing needle into said needle bar and to fixedly angularly orient said thread carrying eyelet with said loop taker, said elongated locator portion also extending from said retaining means laterally of said longitudinal feed directions so as to permit its use as an accessory driving stud.

4,493,280

TWO-POSITION NEEDLE PLATE FOR SEWING MACHINES

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed Sep. 29, 1982, Ser. No. 426,953
Claims priority, application Italy, Dec. 18, 1981, 42922 A/81
Int. Cl.³ D05B *73/12*
U.S. Cl. 112—260 **4 Claims**



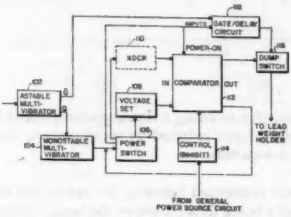
1. A two-position needle plate and base of a sewing machine, said plate being provided with two needle holes of different shape which can be brought alternatively into coincidence with the path of the vibrations of the needle by the rotation of said needle plate, and retaining and operating means by which said needle plate can be raised from its operating position in which it rests on the base to a height sufficient so that it can be rotated above said base without being disconnected from it and alternatively can be raised to a greater height so as to be disconnected and removed from said base, said retaining and operating means comprise a pin connected centrally to said needle plate and extending perpendicularly downward, a first spring element adapted to exert an upwardly vertical thrust on said pin, a second leaf spring element adapted to exert an action opposing the upward thrust of said first spring element, and a manual control member provided on said base in order to regulate the intensity of said opposing action exerted by said second leaf spring element.

4,493,281

SHALLOW DEPTH LEAD WEIGHT EJECTION CIRCUIT

Jeffrey L. Coleman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,520
Int. Cl.³ F42B *19/00*; B63G *9/04*
U.S. Cl. 114—20 R **10 Claims**



1. A circuit for ejecting ballast weights when an underwater, self-powered vehicle fails during operations which comprises:

means, connected to receive a voltage level signal representing the actual depth of the submersible vehicle and a preset reference voltage level signal representing a predetermined depth limit, for comparing both voltage level signals and emitting output signals when the actual depth is greater than the depth limit;

means, connected to receive power from the submersible's basis power source, for forming a periodic signal with a predetermined period T;

means, connected to receive the periodic signal from the forming means, for establishing a short pulse signal output of duration t much less than T, and with the same period T;

means, connected to receive the output short pulsed signal from the establishing means and an output signal from the comparing means, for switching on power at its output, said output power being in the form of the short pulsed signals when no input occurs from the comparing means but being in a continuous form when the comparing means is transmitting a signal to said switching means, said switching means output connected to the comparing means for powering-up the comparing means during periods when the switching means emits output signals;

means, connected to the output of the switching means and connected to receive power from the submersible vehicles basic power source, for setting the preset reference voltage level at its output to be input to the comparing means;

means, connected to monitor the submersible vehicle's operational power circuit, for inhibiting operation of the comparing means when the operational power circuit is functioning properly, said inhibiting means having an output connected to the comparing means for transmitting the inhibiting signal;

means, connected to receive the periodic signal from the forming means and the signal output from the switching means, for gating a command signal of a predetermined delay at its output; and

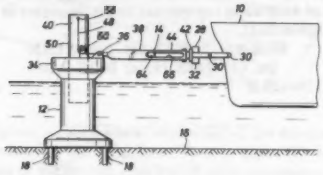
means, connected to the output of the comparing means and to the output of the gating means, for dumping the ballast, said dumping means being powered on by the signal output from the comparing means and being later activated to release the ballast by the command signal from the gating means.

4,493,282

COMBINATION MOORING SYSTEM

John E. Ortloff, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Mar. 18, 1983, Ser. No. 476,677
Int. Cl.³ B63B 21/00, 21/52
U.S. Cl. 114—230 15 Claims



1. An apparatus for mooring a floating vessel which is acted upon by a loading force induced by wind, waves, ice, or an ocean current, comprising:

a base;

mooring means connected between the vessel and said base and generally being located above the water surface, said mooring means having a mean position when the vessel is not acted upon by the loading force and being displaceable from its mean position to accommodate movement, induced by the loading force, of the vessel relative to said base;

buoy means partially located within said base and connected to said mooring means, said buoy means capable of being submerged, as said mooring means is displaced from its mean position by the loading force, to provide a buoyant restoring force for urging said mooring means toward its mean position; and

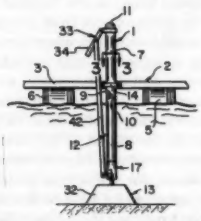
stop means attacted to said mooring means for limiting the excursion of said mooring means from its mean position.

4,493,283

FLOATING BOAT DOCK ANCHOR

Richard E. Elliott, 17 Hope Rd., Mineral City, Ohio 44646

Filed May 25, 1983, Ser. No. 497,760
Int. Cl.³ B63B 21/52
U.S. Cl. 114—263 9 Claims



1. An anchor construction for a floating dock including:

(a) post means adapted to be operatively connected to a floating dock for maintaining the dock in a desired position;

(b) a base adapted to rest on the bottom of a lake said base having ball means formed on the base for engagement by the post means;

(c) spherical-shaped socket means formed on the bottom of the post means for receiving the ball means therein to removably attach and lock the post means to the base;

(d) a flap pivotally mounted on the bottom of the post means and communicating with the socket means to enable the ball means to be locked on and unlocked from the socket means;

(e) lever means connected to the flap and extending upwardly along the post means; and

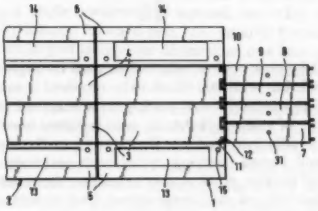
(f) an operating handle mounted on an upper portion of the post means and connected to the lever means for operating the flap from the dock for locking and unlocking the post means to and from the ball means on the base.

4,493,284

PONTOON FOR FLOATING BRIDGES AND FERRIES

Theodor Echtler, Kaiserslautern, Fed. Rep. of Germany, assignor to IBEK Ingenieurbuero Echtler Kaiserslautern GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,648
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206222
Int. Cl.³ B63C 1/02
U.S. Cl. 114—267 5 Claims



1. A pontoon assembly for floating bridges and the like, comprising:

(a) four pivotally interconnected articulable floats providing a pontoon assembly having a folded position and an unfolded position;

(b) said floats being generally rectangularly shaped and of substantially equal dimensions and having a length greatly exceeding the width;

(c) said floats when in said unfolded position providing an adjacent inner two floats and an outer two floats and each of said outer two floats is lengthwise connected to an outer edge portion of one of said two inner floats;

(d) each of said inner two floats has an upper surface when in said unfolded position for providing a vehicular roadway;

(e) a rectangular recess disposed in each of said outer two floats and having a length substantially equal to said float length and a width substantially equal to one-half said float width;

(f) at least two rectangular ramp parts having a length and width substantially corresponding to said recess length and width and each of said ramp parts removably positionable in one of said recesses;

(g) each of said ramp parts has a height corresponding to the depth of said associated recess whereby an upper surface of said ramp part is flush with an upper surface of the associated outer float for providing a personnel walkway when in said unfolded position and for permitting said floats to assume said folded position;

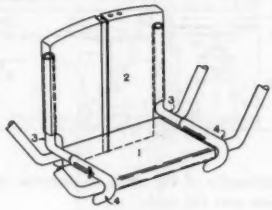
(h) each of said ramp parts has lugs extending outwardly lengthwise from the ends thereof; and,

(i) each of said inner floats has a plurality of recesses disposed along the widthwise ends thereof and said inner floats recesses adapted for removably receiving therein said lugs of said ramp parts when said ramp parts are removed from said recesses for thereby providing a closed rampway.

4,493,285
ADJUSTABLE EXPANDABLE SLIP-ON CANOE BACK REST

Donald F. Williams, 53 E. Lakewood Dr., Fenton, Mo. 63026

Filed Feb. 16, 1983, Ser. No. 456,857
Int. Cl.³ B63B 17/00
U.S. Cl. 114—363 1 Claim



1. An improvement in a canoe seat backrest which is a unique combination of three adjustments which, when taken all together only, provide for mounting this backrest to the seats of any number of different type canoes, regardless of the confines of the canoe or type seat, and which adjustments are:

A. a two-piece backrest wherein one piece has horizontal adjustment slots at top and bottom and the opposite overlapping piece has a corresponding hole at top and bottom, both pieces are then held together and adjustment in width is provided by means of bolts passing through both top and bottom holes and slots of overlapping two-piece backrest from front with nuts at back;

B. two tubular L-shaped supports of which upright leg of "L" of each support is mounted within a socket at each side of a complete backrest, thereby providing free rotation adjustment of each tubular support for mounting backrest within the angular confines of a canoe's aft seat;

C. two tubular hook-shaped arms, one for each side of a complete backrest, having opposite end of hook sized to slide inside the lower leg of the L-shaped tubing supports, thereby providing adjustment as the hook end of arms together with the lower part of backrest clamping engage the canoe seat.

4,493,286
METHOD AND APPARATUS FOR APPLYING A MULTI-COMPONENT ADHESIVE

William J. Carson, Sewickley, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 516,679
Int. Cl.³ B05D 1/02; B05B 7/12, 7/26
U.S. Cl. 118—677 19 Claims

1. An applicator for a multi-component liquid adhesive consisting of a mixture of a liquid resin and a liquid hardener comprising:

(a) a liquid resin resevoir;

(b) a liquid hardener reservoir;

(c) means for mixing liquid resin and liquid hardener to form a multi-component liquid adhesive;

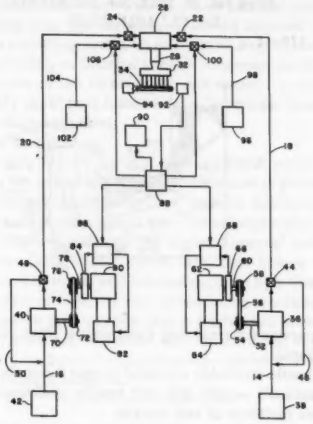
(d) an adhesive dispersing means;

(e) a liquid resin conduit means connecting the liquid resin reservoir to the means for mixing liquid resin and liquid hardener;

(f) a liquid hardener conduit means connecting the liquid hardener reservoir to the means for mixing liquid resin and liquid hardener and means for moving the hardener through said conduit means to the means for mixing liquid resin and liquid hardener;

(g) a resin pump for moving resin from the liquid resin reservoir through the resin conduit means to the means for mixing liquid resin and liquid hardener and a variable output capacity power source for driving said resin pump;

(h) means for sensing the instantaneous speed of the resin pump; and

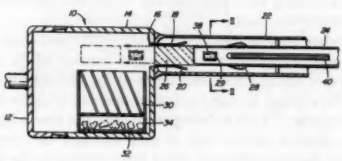


(i) means for varying the instantaneous power output of the power source for driving the resin pump such that said output is proportional to the instantaneous speed of said resin pump.

4,493,287
DIFFUSION EQUIPMENT

Anthony J. Springthorpe, Richmond, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 3, 1982, Ser. No. 446,441
Int. Cl.³ C23C 13/08
U.S. Cl. 118—719 8 Claims



1. Apparatus for use in diffusing a first material into a second material at high temperature, the apparatus comprising a first refractory vessel defining a first chamber for housing a semiconductor wafer, a second refractory vessel defining a second chamber, and a third refractory vessel defining a third chamber for housing a diffusion source, the first and second vessels having an opening therebetween, the third refractory vessel shaped to permit sliding thereof through the opening from the second vessel into the first vessel, a leading part of the third vessel being a close sliding fit within the opening, a trailing part of the third vessel having a positive sealing abutment with the opening, and an intermediate part of the third vessel having an aperture therein whereby with the leading part of the third refractory vessel within the opening, the third chamber is positioned inside the second chamber and is substantially isolated from the first chamber so that when the apparatus is heated diffusion species from the diffusion source cannot contact the wafer, and with the trailing part of the third vessel positively sealingly abutting the opening, the first chamber is united with the second chamber through said aperture so that diffusion species from the source can contact the wafer.

4,493,288

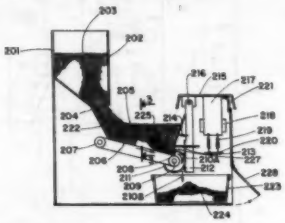
CONTINUOUS PET LITTER CLEANING APPARATUS

Donald van der Kolk, 229 Shore Rd., Mt. Sinai, N.Y. 11766

Filed Jul. 15, 1983, Ser. No. 513,817

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—1 **16 Claims**



1. Apparatus for removing spent animal litter, comprising:

(a) a frame,

(b) a treadle moveably mounted to said frame for accepting an animal's weight and said treadle positioned to move under the force of said weight,

(c) an endless belt having an upper and a lower surface, said belt being positioned to support animal litter on its upper surface,

(d) a first roller having an axis of rotation positioned generally horizontally, said first roller being rotatably mounted to said frame for rotation about its axis of rotation and at a location to support one end of said endless belt,

(e) a second roller having an axis of rotation positioned generally horizontally, said second roller rotatably mounted to said frame for rotation about its axis of rotation and at a location to support the opposite end of said endless belt, at a lower elevation than said first roller,

(f) means connecting said treadle to one of said rollers to rotate said one of said roller as the treadle is moved under the weight of an animal, the rotation of said one of said rollers moving the upper surface of the belt and the litter on this surface, and

(g) a closure barrier connected to the frame and positioned over and generally orthogonal to a portion of the upper surface of the belt and transverse to the movement of the belt, the closure barrier having an opening adjacent to the upper surface of the belt to permit only the lower layer of litter adjacent to the belt to pass through the opening, thereby passing primarily spent litter located in the lower layer of litter, while retaining primarily unused litter located above the opening in the closure barrier.

4,493,289

FLEXIBLE CABLE ION DISPENSER FOR TREATMENT ZONES

Donald G. Saurenman, Whittier, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation-in-part of Ser. No. 124,242, Feb. 25, 1980, Pat. No. 4,282,830. This application Mar. 9, 1981, Ser. No. 241,684

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

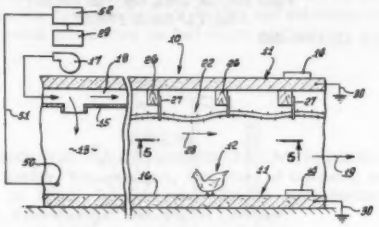
Int. Cl.³ A01K *31/00*

U.S. Cl. 119—21 **23 Claims**

1. Ion dispensing apparatus comprising

(a) a flexible cable including an elongated metallic core to which voltage is applicable, the cable including a protective sleeve of insulating material on and extending along and about the core, the sleeve defining a wall,

(b) and needles having shanks penetrating through said sleeve wall and extending sidewardly adjacent the core to make electrical contact therewith so as to receive application of said voltage, the needles having tips openly exposed outwardly of the cable to dispense ions into the atmosphere near the cable.



4,493,290

MILK YIELD RECORDING AND CONCENTRATE FEED RATION CALCULATION FOR DAIRY COWS

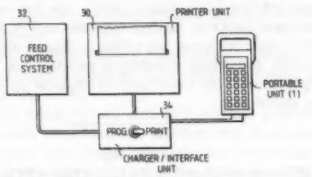
David W. Gibbard, Royston, England, assignor to Dataface Limited, England

Filed May 18, 1983, Ser. No. 495,775

Claims priority, application United Kingdom, May 27, 1982, 8215562

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—51 R **19 Claims**



7. Apparatus for determining feed concentrate rations for dairy cows, comprising:

a hand-holdable microprocessor based recorder having a keyboard, a solid state memory having a section in which cow identities are pre-recordable and a section in which identities of cows entering a milking parlour for a milking session are recorded, and a comparator unit for comparing entered cow identities with recorded cow identities in order to verify the latter,

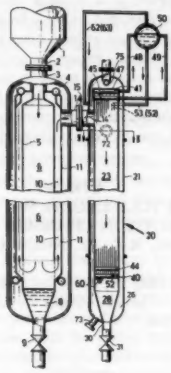
a master processor unit to which the recorder is connectable to enable the master unit to record milk yields (Y) previously entered into the recorder via its keyboard in relation to the validated cow identities, the master unit having a temporary memory for storing the milk yields and a permanent memory for storing pre-determined values for "maintenance +" (M), lactation period (L(t)) and cow condition (C) in relation to cow identities, and including an arithmetic unit for programmed computation of feed concentrate ration (R) in relation to cow identities generally in accordance with the algorithm: $R=V(Y-M+L(t)+C)$,

means for displaying the computed feed rations in relation to cow identities.

4,493,291
GAS COOLER ARRANGEMENT

Jaroslav Zabelka, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,313
Claims priority, application Switzerland, Oct. 26, 1981, 6812/81
Int. Cl.³ F22D 1/00
U.S. Cl. 122—7 R 14 Claims



1. A gas cooler arrangement for a coal gasification plant, said arrangement comprising

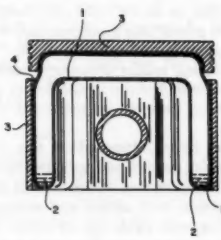
a first pressure vessel having a peripheral radiant cooling wall defining an axial downcomer chamber for receiving a flow of particle-laden gas and a surrounding cooling surface about said wall defining an annular riser chamber therebetween; and

a convection gas cooler connected at an upper end to a top of said annular riser chamber, said cooler including a vertically disposed second pressure vessel, a faller flue composed of vertically disposed heat-removing tubes, at least one riser flue composed of heat removing tubes, and an ash chamber connected to said flues at a bottom end of said second pressure vessel.

4,493,292
HEAT PIPED PISTON

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Filed Jun. 9, 1983, Ser. No. 502,576
Int. Cl.³ F01P 9/02
U.S. Cl. 123—41.2 3 Claims



1. A piston adapted for use in a reciprocating piston internal combustion engine having a cylinder for carrying same,

said piston including a crown portion with a cylindrical skirt extending downwardly therefrom, a hole below the crown portion perpendicular to the vertical axis of the piston adapted to receive a wrist pin, said skirt having two thrust faces which function as bearings in interaction with a wall of the cylinder to take thrust forces generally perpendicular to both said wrist pin hole axis and said cylinder central axis, said thrust faces having opposed internal surfaces extending across its entire axial length, the crown portion having an internal surface connected to the internal surfaces of the thrust faces, and means for providing extremely rapid heat transfer from the piston crown portion to the piston skirt,

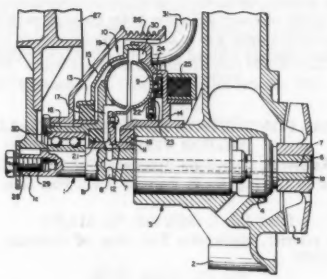
said means comprising:

a thin flexible hollow capsule partially filled with a liquid adapted for evaporation and condensation at piston operating temperatures said hollow capsule having surfaces shaped to fit closely against only the internal surface of the piston crown portion and the opposed internal surfaces of the thrust faces of said piston skirt, said hollow capsule being bonded to the said internal surfaces by a thin elastomeric layer of high thermal conductance whereby a high conductance heat transfer path is established between the piston crown and the piston skirt thrust faces, to provide generally isothermal conditions throughout the piston at all operating conditions.

4,493,293
HYDRODYNAMIC DEVICE

Jürgen Paul, Stuttgart; Andreas Braatz, Rutesheim, and Hans Hanke, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,131
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241835
Int. Cl.³ F01P 5/04, 5/12
U.S. Cl. 123—41.12 15 Claims



1. Apparatus for an internal combustion engine comprising

a cooling circuit having a fluid medium,

means for heating the fluid medium having a casing and comprising

turbine rotor means,

stator means,

shaft means to which a first one of said rotor means and stator means is rotatably mounted and to which a second one of said rotor means and stator means is fixed for non-rotation,

at least one of a water pump impeller and fan rotor mounted to said shaft means for non-rotation with respect thereto,

clutch means for engaging and releasing from rotation of one of said rotor means and stator means with respect to the casing,

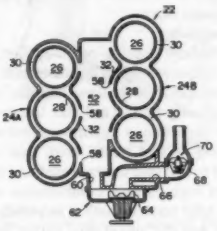
means for actuating said clutch means to one of said engagement and release states to cause the shaft means and at least one of said fan rotor and pump impeller to effect a stationary condition with respect to the casing and to effect rotation with respect to the casing.

4,493,294

COOLING SYSTEM OF V-TYPE INTERNAL COMBUSTION ENGINE

Yukio Umemura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 15, 1982, Ser. No. 449,987
Claims priority, application Japan, Dec. 22, 1981, 56-207571
Int. Cl.³ F01P 3/02
U.S. Cl. 123—41.33 **8 Claims**



1. A cooling system of a V-type internal combustion engine having a cylinder block with two angularly disposed first and second cylinder banks each having a plurality of engine cylinders, comprising:

means defining a coolant passage formed around each engine cylinder;

means defining a coolant gallery located between the first and second cylinder banks and extending along the row of engine cylinder of each cylinder bank, said coolant gallery being in communication with a coolant pump at an outlet member; and

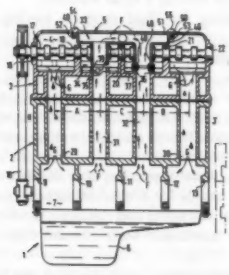
a partition wall for separating said coolant gallery from each coolant passage formed around the engine cylinder of each cylinder bank, each partition wall being formed with a plurality of communication holes through each of which said coolant gallery is in direct communication with each coolant passage formed around each engine cylinder.

4,493,295

INTERNAL COMBUSTION ENGINE, ESPECIALLY FOR MOTOR VEHICLES

Herbert Ampferer, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,477
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225478
Int. Cl.³ F01M 13/00
U.S. Cl. 123—41.86 **21 Claims**



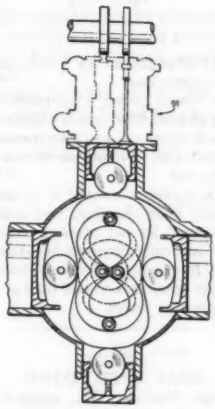
1. An internal combustion engine having a cylinder crankcase and cylinder head provided with a cover, said cylinder crankcase including a crank space and said cylinder head and cover delimiting a valve-actuating space, the engine comprising at least one oil return channel means for returning oil from said valve-actuating space to said crank space and at least one vent channel means for passage of venting medium from said crank space, said at least one oil return channel means and said at least one vent channel means extending between said crank space of the cylinder crankcase and said valve-actuating space formed by the cover and the cylinder head, said at least one oil return means and said at least one vent channel means being separate and disposed at a distance from one another, guide means disposed within said valve-actuating space for guiding venting medium from said at least one vent channel means, the at least one vent channel means air guide means cooperating inside of the valve-actuating space in such a manner that the venting medium flowing through the at least one vent channel means is guided substantially independently of medium flowing in the at least one oil return channel means.

4,493,296

THREE CYCLE ENGINE WITH VARYING COMBUSTION CHAMBER VOLUME

Gerald J. Williams, R.R. #2, Nolalu, Ontario, Canada P0T 2K0

Filed May 28, 1981, Ser. No. 268,019
Int. Cl.³ F02B 75/22
U.S. Cl. 123—55 AA **3 Claims**



1. A three cycle, internal combustion engine, comprising in combination

a cylinder block having a number of cylinders,

a piston reciprocal in each of said cylinders,

a radial profiled power cam shaft provided with journals for rotatable support in said cylinder block,

a piston connecting means defining a means operatively connecting each said piston to said power shaft to convert its reciprocating motion to rotational motion of said power shaft,

a cylinder head means, disposed on top of said cylinder block and closing each of said cylinders to form a combustion chamber therein, said cylinder head means including charge admission port means and exhaust port means communicating with each said cylinder, and charge admission valve means to control opening and closing of said charge admission port means and exhaust valve means to control opening and closing of said exhaust port means,

valve actuation means between said power shaft and said valve means for actuating said valve means in relation with a position of said piston, with said charge admission port means open momentarily while the piston position is

in a top portion of said cylinder, and with said exhaust port means open during a greater portion of an upward stroke of said piston in said cylinder,

a charge pre-compressor, defining a positive displacement compressor means to compress an air charge to a pre-combustion pressure, said charge pre-compressor being operatively connected to said power shaft, and including means for introducing a combustible fuel into the air charge,

a charge transmission duct defining

communicating ducting between said charge pre-compressor and said charge admission port means,

a combustion chamber volume adjusting means, defining a means to vary the volume of said combustion chamber within limits,

said positive displacement compressor cooperating with said charge transmission duct to provide a sufficient compressed charge of air whereby the mass of the charge admitted into said combustion chamber essentially varies in accordance with the volume of the combustion chamber, thereby allowing control of the engine output by controlling said combustion chamber volume adjusting means,

an ignition means, igniting the charge in said combustion chamber immediately after said charge admission port means has closed, and wherein operation of said combustion chamber comprises three distinct cycles, a high pressure charging cycle, with the piston in the top portion of said cylinder immediately followed by an expansion cycle, carrying said piston to a bottom position in said cylinder, immediately followed by a positive exhaust expulsion cycle carrying said piston back to the top portion of its stroke in said cylinder and wherein said cylinder head means includes a static cylinder head and a telescoping head associated with each of said cylinders, each static cylinder head being disposed on a top end of one of said cylinders, and provided with a bore, coaxial with and communicating with said one cylinder, each static cylinder head containing said exhaust port means and said charge admission port means;

each telescoping head, being reciprocal within limits, within said bore of said associated static cylinder head, each telescoping head including said charge admission valve means and said exhaust valve means, said combustion chamber volume adjusting means including a screw threaded means engageable with each of said telescoping head for controlling position of each said telescoping head within said static cylinder head relative to a top position of said piston.

4,493,297

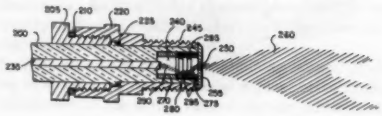
PLASMA JET IGNITION DEVICE

Michael E. McIlwain, Franklin; Jonathan F. Grant, Wayland; Zsolt Golenko, North Reading, all of Mass., and Alan D. Wittstein, Fairfield, Conn., assignors to Geo-Centers, Inc., Newton Upper Falls, Mass.

Filed Sep. 27, 1982, Ser. No. 424,856

Int. Cl.³ F02P *3/08*

U.S. Cl. 123—143 B **15 Claims**



1. In a plasma jet ignition device having an insulating material with a plasma cavity formed therein, a first electrode having an end inserted into said cavity, an orifice plate having an orifice therein comprising one side of said cavity and means for causing an arc discharge to occur within said cavity between said first electrode and said orifice plate, the improvement comprising,

a solid fuel pellet inserted into said cavity, said pellet being responsive to said arc discharge for releasing a gaseous fuel into said cavity.

4,493,298

GLOW PLUG QUICK HEATING CONTROL DEVICE

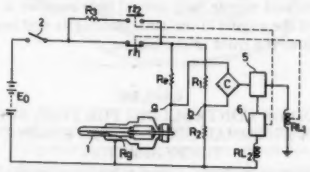
Hideo Kawamura, Tokyo, Japan, assignor to Izuzo Motors, Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 391,035

Claims priority, application Japan, Jun. 30, 1981, 56-102068; Aug. 10, 1981, 56-117646[U]

Int. Cl.³ F02B *9/08*; F02P *19/00*

U.S. Cl. 123—145 A **9 Claims**



3. A control resistor for use with a glow plug, comprising:

a coil including at least two series connected resistance wires having different resistance/temperature characteristics wherein the resistance of said wires substantially equals the resistance of an element of said glow plug; and

an insulating material surrounding said coil.

4,493,299

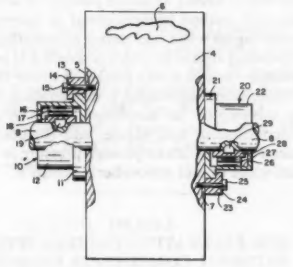
APPARATUS FOR GIVING ENGINES POSITIVE EFFECT

Louis Forde, 482 Berriman St., Brooklyn, N.Y. 11208

Continuation-in-part of Ser. No. 174,363, Aug. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 966,905, Dec. 6, 1978, abandoned. This application Sep. 16, 1982, Ser. No. 406,189

Int. Cl.³ F02N *15/10*

U.S. Cl. 123—185 S **2 Claims**



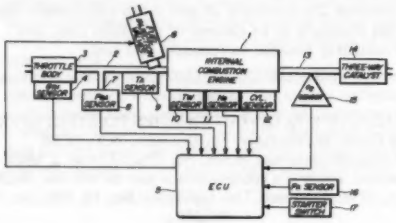
1. Apparatus for providing application controlling transmission pulses of an engine for giving positive effect comprising: base member means having a circular internal cavity about a central axis positively constant engagement means engaging periphery of said internal cavity of said base member simultaneously engaging the external periphery of a sleeve means for defining a rotatable interconnection of said base member with said sleeve means, and positively constant engagement means rotatably surrounds said sleeve means being secured to and surrounding portion of a crankshaft extending out of front of said engine, securing means for said base member includes an

aperture in portion of block means, said block means further includes portion adjacent said base member positioned adjacent said engine, threadingly engaging means adapted in said aperture and threadingly engaging said engine whereby positive constant effective means is defined by said thread engaging means removably securing and mating said block means and said base member means together and with the front of said engine wherein there is a second base member means having a circular internal cavity about said central axis, a second positively constant engagement means engaging the external periphery of a second sleeve means for defining rotatable interconnection of said second base member with said second sleeve means, said second positively constant engagement means rotatably surrounds the second sleeve means being secured to and surrounding a second of said crankshaft extending out of the rear of said engine for receiving, simultaneously, rotational drive from said engine, said second base member is secured to the rear of the engine in the same manner as said base member is secured to the front of the engine.

4,493,300
METHOD OF CONTROLLING THE FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AT DECELERATION

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,202
Claims priority, application Japan, Apr. 8, 1983, 58-61864
Int. Cl.³ F02D 5/02
U.S. Cl. 123—325 **3 Claims**



1. A method of controlling the fuel supply to an internal combustion engine having an intake passage, at deceleration of said engine, said method being adapted to interrupt the fuel supply to said engine when said engine is operating in a predetermined operating region in which is satisfied at least a condition that pressure in said intake passage is lower than a predetermined value, while said engine is decelerating, said method comprising the step of: (a) detecting a value of atmospheric pressure encompassing said engine; and (b) correcting said predetermined value of intake passage pressure in response to the detected value of said atmospheric pressure.

4,493,301
SYSTEM FOR REGULATING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE

Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,659
Claims priority, application Japan, Nov. 19, 1982, 57-204376
Int. Cl.³ F02D 9/02, 31/00
U.S. Cl. 123—339 **2 Claims**

1. A system for regulating the idle speed of an internal combustion engine with an electronic fuel injection system having a bypass around a throttle valve of the engine and a solenoid operated control valve provided in the bypass to control the volume of air flow passing the bypass, comprising:

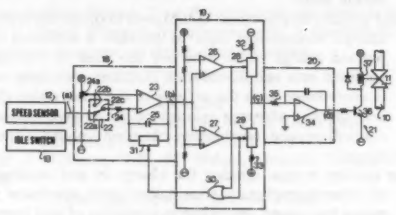
means for sensing the engine speed of said engine and for producing an engine speed voltage;

an idle switch responsive to the idle operation of said engine for producing an idle signal;

a reference voltage circuit for producing a reference voltage corresponding to a predetermined idle speed;

a first integrating circuit comprising an integrator for integrating the difference between said engine speed voltage and said reference voltage and for producing an output, and first switch means for causing said output to go to zero;

a control signal generating circuit comprising first and second comparators which are responsive said output of said first integrating circuit for producing switch actuating signals when said output reaches predetermined upper



limit voltage and lower limit voltage repectively, second and third switch means reponsive to said switch actuating signals for producing a positive going control signal and a negative going control signal, and gate means responsive to said switch actuating signals for operating said first switch means;

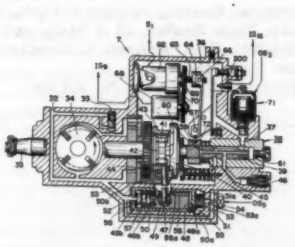
a second integrating circuit responsive to said positive and negative going control signals for producing a control voltage; and

a driver responsive to said control voltage for energizing a solenoid of said solenoid operated control valve to actuate said control valve to regulate the idle speed to the predetermined idle speed.

4,493,302
FUEL INJECTION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yoshihisa Kawamura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 28, 1982, Ser. No. 454,024
Claims priority, application Japan, Feb. 1, 1982, 57-13355; Feb. 3, 1982, 57-14755
Int. Cl.³ F02M 59/20
U.S. Cl. 123—357 **13 Claims**



1. A fuel injection timing control system for an internal combustion engine into which fuel is intermittently injected, the control system comprising:

(a) first means for controlling the timing of fuel injection by a closed-loop control;

(b) second means, fluidly-driven and using working fluid, for

adjustably determining the fuel injection timing, the second means constituting a part of the closed-loop conrol, wherein the response time and the stability of the closed-loop control depend on a condition of the working fluid;

(c) third means for sensing the condition of the working fluid and generating a signal indicative thereof; and

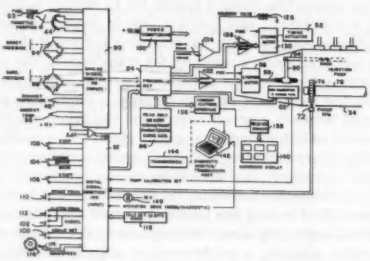
(d) fourth means, responsive to the signal from the third means, for adjusting the response time and the stability of the closed-loop control in accordance with the sensed condition of the working fluid to thereby prevent the influence of the working fluid condition on the response time and the stability of the closed-loop control, the fourth means being another part of the closed-loop control.

4,493,303

ENGINE CONTROL

Lionel D. Thompson; Harold E. Jenkins, both of Hagerstown, Md.; Richard A. Hickerson, Hedgesville, W. Va., and Russell E. Weaver, Sharpsburg, Md., assignors to Mack Trucks, Inc., Allentown, Pa.

Filed Apr. 4, 1983, Ser. No. 482,379
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—357 **80 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 83 Pages)



1. An electronic control for controlling an engine, comprising

engine speed detecting means for generating an electrical engine speed signal corresponding to the speed of the engine,

actual rate-of-change determining means for deriving actual rate-of-change values from the engine speed signal corresponding to both increases and deceases in engine speed,

desired rate-of-change determining means responsive to a demand factor for deriving desired rate-of-change values corresponding to both increases and decreases in the demand factor,

to-be-effected rate-of-change determining means for deriving to-be-effected rate-of-change values corresponding to subtraction of the actual rate-of-change values from the respective desired rate-of-change values,

means responsive to the to-be-effected rate-of-change values for correspondingly increasing and decreasing an engine control value, and

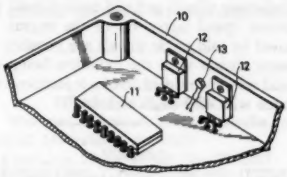
means responsive to the engine control value for controlling the engine.

4,493,304

TEMPERATURE MEASURING DEVICE FOR INTERNAL-COMBUSTION ENGINE

Tetsuo Nakajima, and Hirotaka Kumata, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,605
Claims priority, application Japan, Dec. 27, 1982, 57-195636
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—479 **2 Claims**



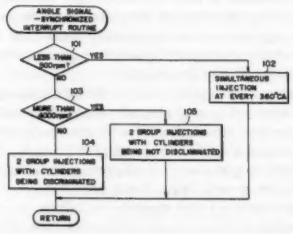
1. A temperature measuring device for an internal-combustion engine, comprising a main temperature sensor operative to measure the temperature of a member such as the cooling water which represents temperature of said internal-combustion engine, means to measure the engine data such as an engine rotation number and an opening angle of a throttle valve, an electronic control unit adapted to receive engine data resulting from said measurement, compute an engine control signal based on said engine data, and feed out the outcome of said computation, an auxiliary temperature sensor disposed near a heat generating member of said electronic control unit and adapted to be heated by said heat generating member, means for discriminating whether or not the output from said main temperature sensor falls within a prescribed range, and means operative, according to the outcome of the judgment by said discriminating means, to select the output of said main temperature sensor when said output of said main temperature sensor falls in said prescribed range or the output of said auxiliary temperature sensor when said output of said main temperature sensor deviates from said prescribed range and feed said selected output in the form of a temperature signal for control of said internal-combustion engine.

4,493,305

ELECTRONIC FUEL INJECTING METHOD AND DEVICE FOR INTERNAL COMBUSTION ENGINE

Toshiyuki Takimoto, and Keiji Aoki, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 1, 1982, Ser. No. 438,523
Claims priority, application Japan, Aug. 9, 1982, 57-138114
Int. Cl.³ F02D *5/02*
U.S. Cl. 123—490 **7 Claims**



1. An electronic fuel injecting method for an internal combustion engine with multi-point injection, wherein fuel injec-

tion timings for plural groups of injectors are controlled in accordance with reference signals generated in the proximity of intake top dead center of a predetermined cylinder and angle signals generated at predetermined rotary angles, characterized in that, during a low rotational speed operation of the engine as detected by monitoring said angle signals, where said reference signals are detected with difficulty, simultaneous injections of all cylinders are performed in accordance with said angle signals, during a medium rotational speed operation of the engine with the cylinders being discriminated by said reference signal, group injections are performed in accordance with said reference signals and said angle signals, and, during a high rotational speed operation of the engine where noise signals caused by said angle signals are possibly mistaken for said reference signals with the cylinders being not discriminated by said reference signal, group injections are performed in accordance with said angle signals.

4,493,306

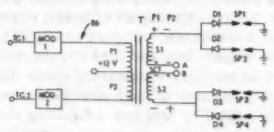
ENHANCED SPARK ENERGY DISTRIBUTORLESS IGNITION SYSTEM (B)

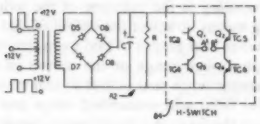
Joseph R. Asik, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 450,932, Dec. 20, 1982, Pat. No. 4,462,380. This application Feb. 23, 1984, Ser. No. 582,976

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—620 **2 Claims**





1. A distributorless ignition system with increased spark energy including:

a first ignition coil having a first primary winding and a first secondary winding;

a second ignition coil having a second primary winding and a second secondary winding;

a first ignition module coupled to said first primary winding;

a second ignition module coupled to said second primary winding;

a supplementary spark energy module coupled to said first and second secondary windings;

a first series combination of a first diode and a first spark plug connected to said first secondary winding;

a second series combination of a second diode and a second spark plug connected in parallel with said first series combination, said second diode being connected in opposite polarity to said first diode;

a third series combination of a third diode and a third spark plug connected to said second secondary winding;

a fourth series combination of a fourth diode and a fourth spark plug connected in parallel with said third series combination, said fourth diode being connected in opposite polarity to said third diode; and

said supplementary spark module including:

a diode bridge having two parallel paths each of two diodes in series;

a module coil coupled to points between the diodes in each of the parallel paths;

a resistor coupled in parallel with said two parallel paths;

a capacitor coupled in parallel to said two parallel paths;

a first pair of transistors coupled in parallel to said capacitor;

a second pair of transistors coupled in parallel to said capacitor;

said first and second pair of transistors each including the series connection of two collector-emitter paths of two transistors, one on either side of a first midpoint in said first pair and a second midpoint in said second pair;

said first midpoint being coupled to said first secondary winding; and

said second midpoint being coupled to said second secondary winding.

4,493,307

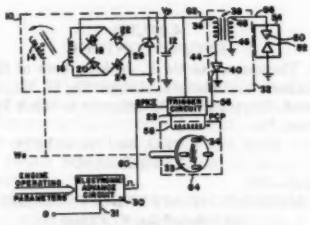
ADVANCE CONTROL FOR BREAKERLESS IGNITION SYSTEM

Lanh T. Trinh, San Diego, Calif., and Robert W. Loy, Granger, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 25, 1983, Ser. No. 517,170

Int. Cl.³ F02P *5/00*

U.S. Cl. 123—630 **7 Claims**



1. In a breakerless ignition system for an engine, said engine having a crankshaft, said ignition system having an ignition coil with a primary winding for receiving a controlled pulse of power and a secondary winding for transforming the power pulse into a high voltage capable of arcing across the gap between the electrodes of a spark plug; a controlled switch connected between a power source and the primary winding, said control switch including a control electrode; a mechanical activating means including a physical timing member rotatable with said crankshaft; and activating means, connected to the control electrode, for activating the controlled switch during a first time period ending at a maximum retard condition of said mechanical activating means in response to said physical timing member attaining a predetermined angular position; said system further comprising an electronic advance control including:

means for generating electronically timed pulses coincident with a scheduled firing advance for the controlled switch;

means, connected in parallel with the controlled switch activating means, for activating the controlled switch in response to said timed pulses;

means for delaying the deactivation of the controlled switch for a time period ending after said first time period ends.

4,493,308

RADIANT/CONDUCTIVE BROILER

James R. Hurley, East Weymouth; Edward F. Searight, Harvard, and Maurice Nunes, Arlington, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 6, 1982, Ser. No. 366,026

Int. Cl.³ A47J *37/00*

U.S. Cl. 126—41 R **11 Claims**

1. A broiler for food products comprising:

an upper heating unit;

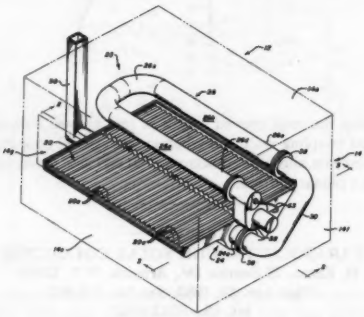
a burner connected to said upper heating unit and operable to deliver hot gases thereto;

a lower heating unit;

conduit means for delivering flue products from said upper heating unit to said lower heating unit; and

an exhaust in fluid communication with said lower heating unit;

said lower heating unit comprising a heat pipe assembly including an inlet for receiving flue products from said conduit means, an outlet, a cooking surface for supporting and transferring heat to said food products, gas conducting means for conveying hot gases from said inlet to said outlet, an evaporator operable to receive heat from said gas conducting means, and a condenser to deliver heat to said cooking surface, said gas conducting means including



an inner pipe with a plurality of openings in its wall, said inner pipe having one end in fluid communication with said conduit means and a closed end opposite said one end, and an outer pipe surrounding said inner pipe, one end of said outer pipe in fluid communication with said exhaust, the openings in the wall of said inner pipe permitting jets of hot gases to form and impinge on the interior surface of said outer pipe to thereby transfer heat to said outer pipe;

said upper heating unit positioned generally above and spaced from said cooking surface and including a tubular member having an inlet for receiving hot gases from said burner and an outlet for delivering flue products to said conduit means.

4,493,309

FUEL FIRED HEATING ELEMENT

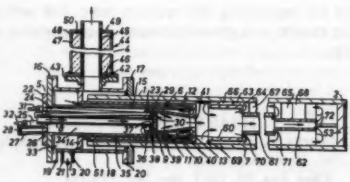
Philip J. Wedge, Cheswick Green, and Robert C. Bridson, Shirley, both of England, assignors to British Gas Corporation, London, England

Filed Sep. 27, 1983, Ser. No. 536,309

Claims priority, application United Kingdom, Sep. 29, 1982, 8227707

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—91 A **7 Claims**



1. A fuel-fired heating element including a tubular housing having one end closed and an opening to provide an outlet for combustion products, a burner assembly received with clearance within the housing between the outlet and the closed end and arranged to direct its combustion products towards the closed end of the housing and a duct received with clearance within the housing to convey the combustion products leaving the burner as a central stream towards the closed end of the housing and as contiguous outer stream within the clearance between the duct and the housing in the opposite direction towards the burner assembly, the duct comprising a plurality of axially aligned tubes, each tube being spaced from the tube adjacent thereto and the tubes being so dimensioned that in a direction downstream of the burner assembly, the upstream tube has an internal diameter greater than the external diameter of the adjacent downstream tube to permit a part of the central stream to discharge into and directly against the flow of the outer stream through the space between corresponding tube pairs.

4,493,310

HEAT EXCHANGER

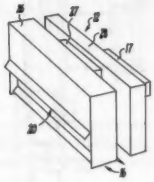
Malcolm B. McInnes, Burwood East, Australia, assignor to Pyrox Limited, Moorabbin, Australia

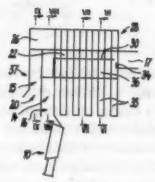
Filed Jun. 29, 1983, Ser. No. 509,207

Claims priority, application Australia, Jul. 1, 1982, PF4665

Int. Cl.³ F24C *3/04*

U.S. Cl. 126—92 C **10 Claims**





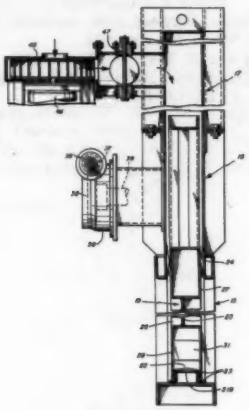
1. A heat exchanger for use in a heating apparatus having a source of heat in the form of a burner arrangement and a flue for discharging combustion products from the heating apparatus, the heat exchanger being arranged to be associated with the heat source so that heat is transferred from the heat source to a working fluid which in use is in heat exchanger relationship with the heat exchanger, said heat exchanger including a main passage having an inlet opening adapted to be located in proximity to the burner arrangement so as to receive substantially all the hot combustion products therefrom and to convey those products through a main portion of the heat exchanger in heat exchanger relationship with the working fluid and thence to the flue of the heating apparatus, a secondary passage having an inlet opening and arranged to receive in normal operation of the heating apparatus substantially all combustion products not received by the main passage and to convey those products to the flue, the secondary passage having an intake portion which extends upwardly from said secondary passage inlet opening and a transfer portion for communicating with the flue, the secondary passage providing a relatively direct flow path for combustion products passing therethrough to the flue, the main passage including an inlet duct which extends upwardly from said main passage inlet opening and which opens into a chamber, the main passage further including a transfer duct extending from said chamber to a further chamber portion, combustion products passing through the main

passage being discharged from said further chamber portion, the outside surface areas of the main passage providing at least a major portion of the heat exchanger surfaces over which working fluid is arranged to pass, the main passage providing an indirect path through the heat exchanger to the flue so that the secondary passage has a lower resistance to flow of combustion products therethrough than the main passage.

4,493,311
GUILLOTINE DAMPER

Lothar Bachmann, Auburn, Me., assignor to Bachmann Industries, Inc., Lewiston, Me.

Filed Oct. 19, 1983, Ser. No. 543,336
Int. Cl.³ F23L *13/06*
U.S. Cl. 126—285 A **5 Claims**



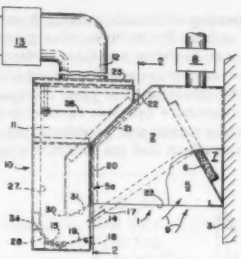
1. A guillotine damper to be incorporated in a duct system, said damper including a frame establishing a passageway through the damper, a blade, an airtight bonnet dimensioned to accommodate the blade and connected to said frame, said frame having a blade accommodating mouth opening into the bonnet, means operable to reciprocate said blade between an open damper position in which the blade is housed in the bonnet and a closed damper position in which the blade blocks the passageway through the frame, a guide attached to the frame and extending about and into the passageway therethrough from one end of the mouth to the other end thereof, said blade provided with a marginal channel coextensive with the guide and disposed and dimensioned to slide along and over corresponding portions of said guide, said frame provided with a resiliently flexible metal seal coextensive with and overlying said guide in a manner such as to be entrant of said channel and be compressed thereby into sealing engagement therewith as said damper is closed.

4,493,312
INDUCTION FLUID SUPPLY UNIT FOR EXHAUST HOOD APPARATUS

Michael L. Moon, West Bend, Wis., assignor to Maysteel Corporation, Mayville, Wis.

Filed Jan. 25, 1982, Ser. No. 342,247
Int. Cl.³ F23J *11/00*
U.S. Cl. 126—299 D **4 Claims**

1. An exhaust hood supply apparatus for injection air into an exhaust hood, an air supply plenum, a slot in said plenum having a substantially continuously curved bottom wall, a separate deflecting plate having a curved coupling wall mounted in abutting movable engagement with said bottom wall, said deflector plate having an extension portion projecting outwardly of said coupling wall to direct said air across the plenum, said curve coupling wall adapted to be pivotally moved over said bottom wall to establish a desired optimum positioning of said extension portion and correspondingly

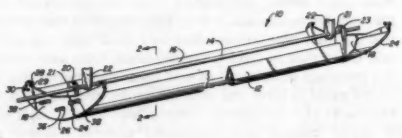


changing the total curved length of said curved bottom wall and said coupling wall, and wherein said curved coupling wall complements said curved bottom wall and said extension portion is a planar portion.

4,493,313
PARABOLIC TROUGH SOLAR COLLECTOR

James H. Eaton, 29 Sunrise Dr., Armonk, N.Y. 10504

Filed Apr. 29, 1982, Ser. No. 372,882
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **13 Claims**



1. A solar collector, including:
(a) a receiver tube;
(b) a foil reflector;
(c) at least two means for forming the foil reflector into a semi-cylindrical parabolic arc having a centroid for focusing solar radiation onto the receiver tube, the forming means at spaced apart intervals along the solar collector;
(d) spreader means attached to at least two of the forming means in the optic shadow of the receiver tube for holding the forming means in spaced apart relation along the solar collector to maintain the parabolic shape of the foil reflector against bending moments and torque;
(e) means for applying the force of the spreader means against the forming means at the centroid of the parabolic arc; and
(f) means for supporting the receiver tube, foil reflector, forming means, and spreader means in cooperating relationship.

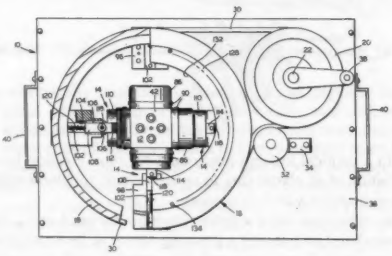
4,493,314
HEART PUMP

Clifton V. Edwards, II, Essex, Conn., assignor to Lundell Laboratories, Inc., Scottsdale, Ariz.

Filed Jun. 30, 1982, Ser. No. 393,765
Int. Cl.³ A61F *1/24*
U.S. Cl. 128—1 D **18 Claims**

1. A mechanical heart pump comprising: a body portion having an inlet thereinto and an outlet therefrom; a first conduit connected to said body portion for directing blood from a patient to said inlet; a second conduit connected to said body portion for directing blood from said outlet to a patient; said

body portion having a first and a second passage defined therethrough in generally parallel spaced independent relationship to each other, said first passage being disposed in communicative relationship with said inlet and said second passage being disposed in communicative relationship with said outlet, each of said passages having a first opening at one end thereof and a second opening at the opposite end thereof, a first passively distensible bladder sealingly secured to said body portion in circumscription about said first openings of said first and second passages a second passively distensible bladder sealingly secured to said body portion in circumscription about said second openings in said first and second passages; a plurality of check valves disposed in said passages one each adjacent each



one of said openings and positioned, respectively, to prevent a back flow from said bladder toward said inlet and prevent a back flow from said outlet toward said bladder; force means operatively associated with said body portion, said force means having a driving means, a driven means, and force transmitting means operatively interposed between said driving means and said driven means, said driven means having an eccentric cam connected thereto in rotatable circumscription about said body portion for selectively engaging one of said bladders while disengaging the other of said bladders to provide a continuous flow of blood from said engaged bladder into said output while permitting a continuous flow of blood from said input into said disengaged bladder.

4,493,315

MASSAGE MEANS

Shoji Iwahashi, Kainan, Japan, assignor to Aisen Kogyo, Ltd., Wakayama, Japan

Filed Jul. 22, 1982, Ser. No. 401,049

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—60 **9 Claims**

1. A massage means comprising a rigid right hand bar, a rigid left hand bar and an intermediate bar disposed between and connected end-to-end to said rigid right hand bar and said rigid left hand bar, said intermediate bar, said right hand bar and said left hand bar each having a length which is longer than their width and a width that is greater than their thickness, said intermediate bar having thick end portions having the same thickness as said right and left hand bars separated by a mid-portion which is thinner and narrower than said end portions,

a pair of spherical pressing members with one each secured to said thick end portions of said intermediate bar perpendicular to its thickness, said mid-portion of said intermediate bar being resilient so that said mid-portion of said intermediate bar bends in a direction such that said spherical pressing members are moved in a direction toward each other when said right hand and left hand bars are moved in a longitudinal plane in a direction toward said pressing members.

4,493,316

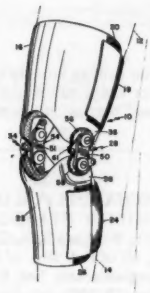
ARTICULATING KNEE STABILIZER

Kenneth E. Reed; Bradley Mason, both of Carlsbad; Jeff Mason, Cardiff by the Sea, and Gregory R. Nelson, Carlsbad, all of Calif., assignors to DonJoy, Inc., Carlsbad, Calif.

Filed Mar. 10, 1983, Ser. No. 474,004

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 C **12 Claims**



1. A human knee stabilizer comprising:

a first shell means attachable to the thigh of the wearer with a lower portion thereof disposed adjacent to at least one side of the knee joint;

a second shell means attachable to the calf of the wearer with an upper end portion thereof disposed adjacent to at least said one side of the knee joint;

and at least one hinge means operatively connecting said end portions of said first and second shell means on at least said one side of the knee for relative pivotal movement between said first and second shell means, said hinge means comprising:

link means pivotally connected to said first shell means at a first pivotal connection and to said second shell means at a second pivotal connection that is spaced from said first pivotal connection,

first and second gear means attached respectively to said first and second shell means and having meshing teeth that are actuate about the respective axes of said first and second pivotal connections, said gear means pivoting with their respective shell means, and

a pinion stop gear adjustably positionable about the arcuate periphery of at least one of said hinge gears with the teeth of said stop gear meshed with the teeth of the hinge gear, said pinion stop gear being engageable with the teeth of the other said hinge gear to stop pivotal movement between said shells at a selected relative pivotal position of said shells.

4,493,317

SURGICAL COMPRESSION PLATE AND DRILL GUIDE

Kaj Klaue, Sierre, Switzerland, assignor to Synthes Ltd. (U.S.A.), Wayne, Pa.

Filed Nov. 16, 1981, Ser. No. 321,602

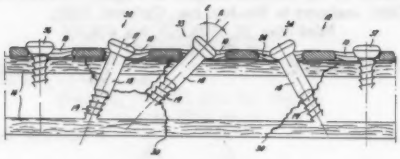
Claims priority, application Switzerland, Nov. 20, 1980, 8599/80

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 D **11 Claims**

1. A surgical device for the stabilization of broken bones and for use in compression osteosynthesis comprising an elongated plate having a top surface, a bottom surface for application to a bone and a plurality of elongated holes, each of said holes having surfaces along each side sloping inwardly and down-

wardly, the width of said holes transversely to their longitudinal axis being constant along their length and the length greater than the width by at least one third the width, there being an undercut surface on the bottom of each of said holes at both ends thereof, said holes being symmetrical about a center line across the width of the holes.



11. A drill guide for drilling holes in a bone said guide comprising a drill socket and a ball-shaped bearing, said socket being attached to said bearing in a position eccentric to the center of the ball.

4,493,318

LOCKING MECHANISM FOR USE WITH TWO ANESTHETIC EVAPORATORS

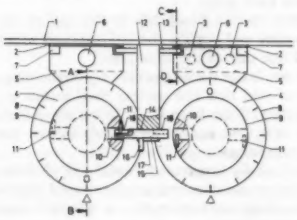
Helmut Mohr, Lübeck; Wolfgang Falb, Krummesse, and Carl F. Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 486,099

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3222047

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.19 **4 Claims**



1. A locking mechanism for use with two anesthetic evaporators, comprising first and second anesthetic evaporators, each evaporator having a rotatable opening valve disc, each disc having a radially extending opening therein, means for mounting said evaporators in side by side relationship such that said discs are separated by a predetermined distance and said respective radially extending openings are in alignment when rotated to face each other, an arm mounted to said mounting means and extending between said discs and having a transverse bore aligned with said respective radially extending openings when rotated to face each other, a cylindrical latch slidably mounted in said transverse bore and having a length slightly greater than said predetermined distance and an accommodation recess adjacent each end at a selected diametric location, a control pin mounted on each of said discs and entering into the opening of the associated disc at one diametric location, the distance between said control pins, when said openings are in alignment when rotated to face each other, being slightly greater than the length of said latch, each respective control pin being of a size to be accommodated within each respective accommodation recess of said latch when the opening of said disc and said control pin are aligned with the accommodation recess of said latch, said latch being positionable in said disc opening of either selected disc with the control pin being accommodated within the accommodation recess to lock the associated disk and to free the other disc for rotation for opening the associated evaporator, said latch also being positionable between said discs so that its respective ends enter into each of the openings of each of said discs to lock both of said disks.

4,493,319

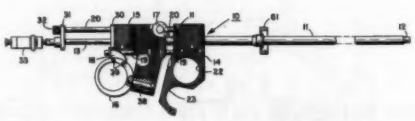
RING APPLICATOR HAVING FLOATING INNER TUBE

Todd J. Polk, Holland, and Jerry Polizzi, Morrisville, both of Pa., assignors to Cabot Medical Corporation, Langhorne, Pa.

Continuation of Ser. No. 278,444, Jun. 29, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,020

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—303 A **15 Claims**



1. In a surgical ligating instrument for tubal ligation by the application of an elastic ring to an anatomical tubular member, the combination which comprises:

a. an elongated inner member having a forward and a rearward end and having a grasping means at its forward end constructed and arranged for grasping said anatomical tubular member to be ligated;

b. handle-less, tube means freely slidably carried upon said inner member (a) with close sliding fit therebetween, said tube means (b) having an outer surface adjacent its forward end over which at least one elastic ring is adapted to fit in a tensioned condition;

said tube means (b) and all portions of the instrument fixedly attached thereto being free of any slot;

c. a slotless outer tube surrounding and having a close sliding fit around the tube means (b) so as to substantially isolate the tube means (b) from the anatomical environment;

d. releasable securing means for securing said tube means (b) in a forward position relative to said outer tube (c);

e. means, operated by sliding together forward and rearward handles, the forward handle being fixedly attached to the inner member (a), the rearward handle being attached to the outer tube (c), to retract said member (a) relative to said tube means (b) to draw said anatomical tubular member rearwardly into said tube means (b);

f. means operated by further sliding together the two handles to retract said tube means (b) relative to said outer tube (c) to eject said elastic ring from the surface of said tube means (b) while said anatomical tube to be ligated extends into said tube means (b), thereby displacing said elastic ring to a position surrounding said anatomical tubular member and effecting tubal ligation thereof; and

g. manually engagable stop means positioned to prevent further retraction of said tube means (b) relative to said outer tube (c) after said elastic ring has been ejected in response to said retraction of said tube means (b), wherein the instrument is free of any spring.

4,493,320

BIPOLAR ELECTROCAUTERY SURGICAL SNARE

Michael R. Treat, 792 Columbus Ave., Apt. 4E, New York, N.Y. 10025

Filed Apr. 2, 1982, Ser. No. 364,977

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.15 **7 Claims**

1. A bipolar electrocautery surgical snare for endoscopic removal of growths within a body cavity, said snare comprising:

a unitary elongated electrically insulating flexible double-

lumen tubular member having a proximal end and a distal end;

a pair of elongated flexible electrically conductive uninsulated snare wires, each snare wire disposed within one of the respective lumina within said tubular member in slidable relation therewith, said snare wires being of a length greater than said tubular member such that each snare wire extends from both the proximal and distal ends of said tubular member;

an electrically insulating connector means disposed at the distal end of each of said snare wires; said connector means mechanically uniting but electrically insulating said distal ends of said snare wires to form a surgical snare loop extending from the distal end of said tubular member; and

means for electrically connecting the proximal ends of said snare wires to a bipolar electrocautery current source; and

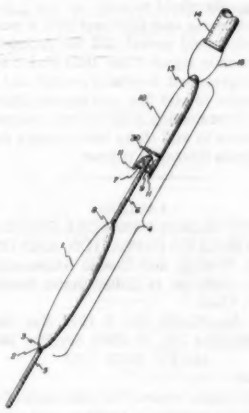
actuator means for sliding the snare wires inwardly or outwardly through the tubular member to respectively expand or contract the surgical loop.

4,493,321

VENOUS VALVE CUTTER FOR THE INCISION OF VALVE LEAFLETS IN SITU

Robert P. Leather, Morehouse Corners Rd., Chatham, N.Y. 12037

Filed May 25, 1982, Ser. No. 381,699
Int. Cl.³ A61F *17/32*
U.S. Cl. 128—305 **27 Claims**



8. A device for cutting venous valve leaflet pairs comprised of:

an elongated cutting member having a forward end and a rearward end and adapted to pass through a vein forward end first without making continuous circumferential contact with the walls thereof, said cutting member having an exposed cutting blade on its forward end facing in the direction of intended movement through a vein;

elongate body means connected by a first rod to the cutting member at its forward end centrally of the cutting blade for centering the cutting member in a vein with its blade sufficiently exposed about the rod to cut enountered valve leaflet pairs as the cutting member is drawn through them; and

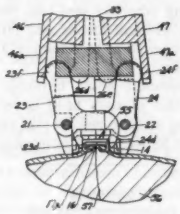
means including a second rod connected to the centering means for drawing the centering means and the cutting member through a vein.

4,493,322

SURGICAL STAPLING INSTRUMENT

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Sep. 28, 1982, Ser. No. 425,542
Int. Cl.³ A61B *17/04*; B31B *1/00*
U.S. Cl. 128—334 R **10 Claims**



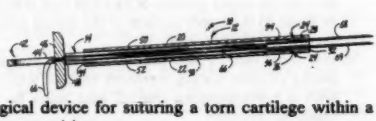
1. A surgical stapling instrument for forming and implanting surgical staples in the tissue of a patient, said instrument having a supply of surgical staples and an anvil, said surgical stapling instrument having a pair of formers pivotally mounted on said instrument to each side of said anvil for rotation only, said formers being swingable between a normal unactuated position and an actuated position wherein they form a surgical staple about said anvil and implant said surgical staple, each former being so configured as to form said staple about that side of said anvil opposite the side adjacent its pivotal mounting, a pair of levers pivotally mounted on said instrument, each lever contacting one of said staple formers, said levers being manually swingable laterally of said instrument between a normal unactuated position with said staple formers in said unactuated position and an actuated position with said staple formers in said actuated position and a resilient means to bias said staple formers and said levers to their respective unactuated positions.

4,493,323

SUTURING DEVICE AND METHOD FOR USING SAME

John P. Albright; Robert K. Martin, and John A. Dyson, all of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 13, 1982, Ser. No. 436,607
Int. Cl.³ A61B *17/06*
U.S. Cl. 128—340 **7 Claims**



7. A surgical device for suturing a torn cartilege within a patient'knee comprising:

an elongated tubular member having an internal end adapted to be positioned in the proximity of the cartilege to be sutured and an external end;

said tubular member having an elongated bore extending longitudinally through said tubular member, said bore having opposite open ends;

plunger means telescopically fitted within said elongated bore for longitudinal sliding movement therein, said

plunger means comprising an elongated body member, and a plunger head;

said body member having a handle at one end thereof and being provided at the opposite end with a threaded opening having cylindrical sidewalls, said cylindrical sidewalls being provided with a tapered cam means which is within said opening;

said plunger head comprising a threaded end portion and a pair of spaced apart bifurcated members which are yieldably movable toward and away from one another;

a pair of spaced apart needles positioned in the space between said bifurcated members and having pointed ends protruding outwardly therefrom;

surgical thread being connected to both of said needles;

said plunger head being threadably insertable into said threaded opening whereby said cam means engages said bifurcated members and forces said bifurcated members toward one another so as to retentively engage said needles therebetween;

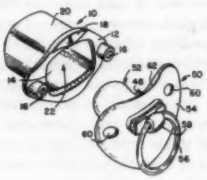
said bifurcated members being movable apart from one another when said plunger head is removed from said threaded opening so as to release said needles from retentive engagement between said bifurcated members.

4,493,324

PACIFIER COVER

Laverne Johnston, Simi Valley, Calif., assignor to Dan LaMere, Sherman Oaks, Calif., a part interest

Filed Jun. 17, 1983, Ser. No. 505,306
Int. Cl.³ A61J 17/00
U.S. Cl. 128—360 9 Claims



1. A pacifier cover for covering and protecting the nipple which is supported by a nipple retaining member of the pacifier, wherein the nipple protrudes from the front face of the nipple retaining member and the nipple retaining member contains a multiplicity of holes, wherein the pacifier cover comprises:

a. a hollow cover portion containing an internal chamber therein;

b. said internal chamber opening into the front face of the pacifier cover;

c. the shape of the front face of the pacifier cover conforming to the shape of the front face of the nipple retaining member of said pacifier;

d. said front face of said pacifier cover containing a protrusion on the upper portion of its front face which conforms in shape to the upper surface of the nipple retaining member of the pacifier; and

e. said front face of said pacifier cover containing a multiplicity of male mating members each of which is aligned with a corresponding one of said holes in said nipple retaining member;

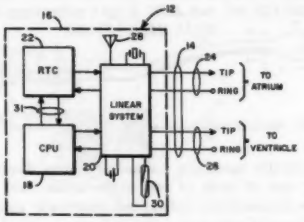
f. whereby when said pacifier cover is brought into engagement with said pacifier, said nipple is retained within said chamber, each of said male mating members is inserted into and retained within a corresponding one of said holes in said nipple retaining member, said protrusion on the upper portion of said front face of said pacifier cover engages the top surface of said nipple retaining member, and said front face of said pacifier cover is securely held against the front face of said nipple retaining member.

4,493,325

TACHYARRHYTHMIA PACER

Jerome T. Hartlaub, New Brighton, and Paul J. Beckmann, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 3, 1982, Ser. No. 374,457
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 6 Claims



1. In a pacer of the type having at least one sense amplifier for detecting depolarization of cardiac tissue and, at least one output amplifier for providing electrical stimulation to the cardiac tissue; an improved tachyarrhythmia detection system comprising:

timing means for determining time periods between successive cardiac depolarizations;

averaging means for calculating the average time period for a preselected number of said time periods producing a running average period;

means for calculating a running average threshold period from said running average period;

means for comparing a time period with said running average threshold period producing a first criteria detection signal if said time period is less than or equal to said running average threshold period;

means for comparing said time period to a preselected programmed threshold period and for producing a second criteria detection signal if said time period is less than or equal to programmed threshold period; and

means responsive to said first and second criteria detection signals for incrementing a tachy beat counter; and

means responsive to said tachy beat counter for initiating a tachyarrythmia treatment regime.

4,493,326

AUTOMATIC BLOOD PRESSURE SYSTEM WITH SERVO CONTROLLED INFLATION AND DEFLATION

Jeremy R. Hill, Weston, and Donald Malinouskas, Monroe, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 81,551, Oct. 3, 1979, Pat. No. 4,328,810.
This application Jan. 29, 1982, Ser. No. 344,051
Int. Cl.³ A61B 5/02
U.S. Cl. 128—680 7 Claims

1. A blood pressure system for automatically measuring systolic and diastolic pressure in a patient, said system comprising:

blood pressure cuff means, adapted for attachment about a limb of the patient and capable of being inflated to occlude the artery of the limb during an inflation cycle and capable of being deflated during a deflation cycle;

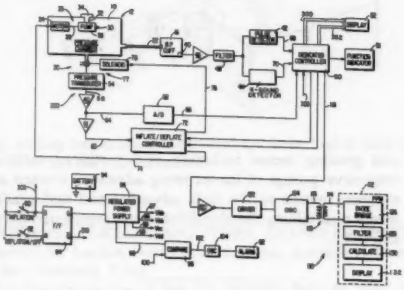
pressure chamber means in fluid communication with said cuff means so that, at any given time, the pressure within said chamber is substantially the same as the pressure within said cuff means;

transducer means for producing an electrical signal indicative of the actual pressure within said chamber means;

error means receiving the electrical signal from said transducer means for producing an error signal indicative of

the difference between the actual rate of change of pressure within said chamber and a desired rate of change of pressure within said chamber;

pressure increasing means responsive to said error signal during said inflation cycle, said pressure increasing means comprising means for variably duty cycle modulating said error signal to produce a control signal and means responsive to said control signal for increasing the pressure within said chamber thereby inflating said cuff; and



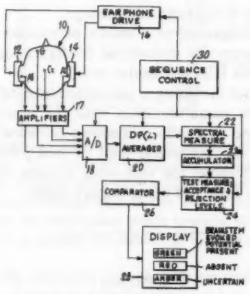
pressure decreasing means responsive to said error signal during said deflation cycle, said pressure decreasing means comprising means for variably duty cycle modulating said error signal to produce a control signal and means responsive to said control signal for decreasing the pressure within said chamber thereby deflating said cuff.

4,493,327

AUTOMATIC EVOKED POTENTIAL DETECTION

Michael Bergelson, Port Chester; Jacob Fridman, Kew Gardens, and Erwin R. John, Mamaroneck, all of N.Y., assignors to Neurometrics, Inc., New York, N.Y.

Filed Jul. 20, 1982, Ser. No. 400,150
Int. Cl.³ A61B 5/04
U.S. Cl. 128—731 **20 Claims**



20. A method comprising the steps of:

(a) deriving a first brainwave in the absence of a stimulus;

(b) sampling the brainwave to produce digital samples DP(i) of the brainwave to form an epoch n=1, repeating to form an epoch n=2, and repeating to form a total of N epochs, where n=1, 2, . . . , N, and forming the N epochs into a group K;

(c) finding for the group K produced in the immediately preceding step an averaged waveform K;

(d) deriving a second brainwave for the same subject in the presence of the stimulus;

(e) repeating steps (b) and (c) for the second brainwave;

(f) repeating the sequence of steps (a) through (e) for successive first and second brainwaves to produce for each a respective sequence of groups K=2, K=3, . . . , K=K(min), and producing for each repetition a respective pair of averaged waveforms K, a respective spectral measure P(K) for the absence of the stimulus and a respective spectral measure P'(K) for the presence of the stimulus;

(g) finding a test measure V(K) as a function of the difference between said spectral measure P(K) and P'(K) derived from said waveforms and of the variance thereof;

(h) finding an acceptance level Va(K) and a rejection level Vr(K) as respective functions of at least the number of groups K for which said spectral measures have been found;

(i) evaluating the test measure relative to said acceptance and rejection levels to determine if the difference between the first and second averaged waveforms, as reflected in said test measure V(K), is likely to correspond to the presence of a significant evoked potential in response to said stimulus, or to the absence of said potential, or to an uncertainty as to the presence or absence of said potential;

(j) in case the determination results in a finding of uncertainty, repeating the sequence of steps (a) through (i) using successively incremented values of K(min) in step (f) until step (i) yields a determination of either the likely presence of said potential or steps (a) through (i) have been repeated a selected maximum number of times such that K=K(max); and

(k) producing a tangible representation of said determination.

4,493,328

APPARATUS FOR TREATING SPASMODIC TORTICOLLIS

Iwao Saito, International House, 3701 Chestnut St., Philadelphia, Pa. 19014

Filed Jul. 2, 1982, Ser. No. 394,835
Int. Cl.³ A61B 5/10
U.S. Cl. 128—782 **8 Claims**

1. An apparatus for treating spasmodic torticollis, comprising:

means for emitting a beam of light;

means for fastening said light emitting means to the head of a person being treated;

a photosensor which responds to a light beam from said light emitting means to change an output thereof;

means adapted to be attached to the trunk of a person for supporting said photosensor in a fixed position with respect to the trunk of the person so that said photosensor may receive a light beam from said light emitting means while the person holds his head in a mid position;

a switching circuit connected to said photosensor, which responds to an output from said photosensor to control a circuit output thereof;

an operant connected to said circuit, which responds to the output from said switching circuit to produce an effect on the person;

an accumulator connected to said circuit, which responds to the output from said switching circuit to produce an elec-

trical signal which is directly proportional to the time period during which said switching circuit is producing the circuit output; and

display means connected to said accumulator which responds to an electrical signal from said accumulator to provide a display indicative of the total time period during which the person has been able to hold his head in the mid position.

4,493,329

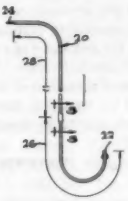
IMPLANTABLE ELECTRODE HAVING DIFFERENT STIFFENING AND CURVATURE MAINTAINING CHARACTERISTICS ALONG ITS LENGTH

Lynn Crawford, 27406 Diane Marie Cir., and William A. McArthur, 27544 Lovage Ct., both of, Saugus, Calif. 91350

Filed Aug. 19, 1982, Ser. No. 409,393

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **11 Claims**



1. In a medical electrode for conducting an electrical stimulation pulse from a pulse generator to a location within a living body, said electrode being encased in an encasing material which is generally inert to body fluids and terminating in an exposed, electrically conductive electrode tip, an improved electrode comprising:

at least one spirally-wound continuous portion of a predetermined length one end of which is connected to the electrode tip, said spirals defining a cylinder having a predetermined diameter; and

at least one spirally-wound stiffening and curvature-maintaining portion having a length less than one half of said predetermined length, said stiffening and curvature-maintaining portion spirals defining a cylinder having substantially the same predetermined diameter as that defined by said continuous portion spirals, the spirals of said stiffening and curvature-maintaining portion being located in a juxtapositional relationship with respect to the spirals of a portion of said continuous portion, said stiffening and curvature-maintaining portion being located within the half of said continuous portion proximal to said electrode tip, said continuous portion and stiffening and curvature-maintaining portion combination providing greater stiffness and curvature maintenance than said continuous portion alone.

4,493,330

TOBACCO STRIPPER AND GRADING MACHINE

Norris Price, Rte. 1, Surgoinsville, Tenn. 37873

Filed Dec. 30, 1982, Ser. No. 454,578

Int. Cl.³ A01D *45/16*

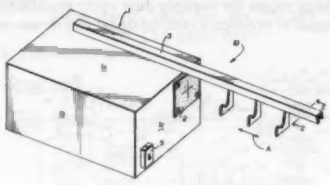
U.S. Cl. 130—31 R **14 Claims**

1. A device for grading into two or more grades and then stripping tobacco leaves or the like from the associated stalk, the device comprising:

support means supporting the stalk and including grading means movably mounted on said support means, said grading means including partitions which segregate respective groups of leaves on the stalk into corresponding grades,

stripping means positioned adjacent to one end of said support means adapted to allow the stalk to pass therethrough but retain the leaves still segregated into grades by said partitions, and

means for advancing the stalk through said stripping means,



said grading means including said partitions with the respective groups of leaves being advanced toward said stripping means as the stalk advances and said grading means maintaining the groups of leaves segregated during stripping.

4,493,331

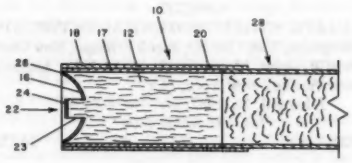
CIGARETTE FILTER

Harry S. Porenski, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Aug. 2, 1982, Ser. No. 404,107

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **12 Claims**



1. A filter for a cigarette comprising:

a filter rod fabricated of a smoke permeable material and being of generally cylindrical configuration having opposed smoke inlet and outlet ends;

said mouth end including a protrusion integral with and in smoke flow communication with the smoke permeable material and coaxially projecting outwardly from said filter rod, the peripheral wall of said protrusion being smoke permeable, the remaining portion of said mouth end of said filter rod being impermeable.

4,493,332

HAIR CLIP

Wolfgang Burger, Ritterstrasse 19, DE-3260 Rinteln 1, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,141

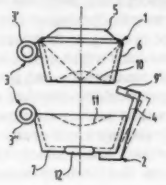
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 8203375[U]

Int. Cl.³ A45D *8/00*

U.S. Cl. 132—46 A **6 Claims**

1. A hair clip for use as a hair ornament comprised of an ornamental stone or element in a setting means, a clip member which is directly connected to the setting means and being sized and shaped to essentially lie hidden behind the ornamental stone and means for removably securing said clip member to said setting means with a limited quantity of hair being

retained therebetween wherein said clip member has a frusto-conical shape with tapered interior and exterior side walls and



said setting means has a frusto-conical shape and is sized so as to fit within said clip member.

4,493,333

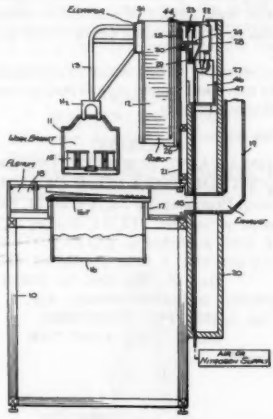
CORROSION-RESISTANT WORK TRANSFER SYSTEM

Howard M. Layton, New Fairfield, Conn., assignor to Interlab, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 443,894, Nov. 23, 1982, Pat. No. 4,466,454. This application May 13, 1983, Ser. No. 494,383

Int. Cl.³ B08B *3/04*

U.S. Cl. 134—76 **9 Claims**



1. In combination with a work station provided with a bench having a row of chemical processing stages thereon, each having a tank adapted to receive a handled basket carrying the work, the environment above the stages being chemically corrosive, and an automated work transfer system to convey said basket in a desired sequence to said stages, said system comprising:

A. An apron vertically mounted above said work bench at the rear thereof to provide a barrier between said corrosive environment and the region behind the apron; said apron at its rear supporting a horizontal track adjacent the top of the apron;

B. a robot assembly riding on said track, said assembly including a robot positioned in front of said apron, a plate extending from the upper end of the robot and projecting over the top of the apron into said rear region, load-bearing wheels supported by said plate and running on said track, a horizontal rack mounted below said track, and an external motor supported from said plate, the shaft of the motor having a pinion thereon which engages said rack to cause said assembly to travel along said track to a position in line with a selected tank in said row;

C. an elevator carriage which rides up and down the front face of the robot and is provided with a hoisting arm having a hand adapted to engage the handle of said basket, said carriage being driven by an internal motor disposed in said robot to cause the carriage to lower the basket into the selected tank and to thereafter lift the basket therefrom.

4,493,334

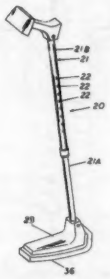
WALKING AID

Stephen Semanchik, 21 Lance Cir., Bldg. G, Bridgeport, Conn. 06606, and George Mezei, 640 W. 231st St., Bronx, N.Y. 10463

Filed Sep. 30, 1982, Ser. No. 429,111

Int. Cl.³ A45B *9/00*; A61H *3/00*

U.S. Cl. 135—75 **5 Claims**



1. A walking aid comprising:

an elongated shaft capable of supporting a person's weight,

a foot pad simulating an anatomical foot having a toe portion,

a heel portion, and an arcuate sole portion extending between said toe and heel portion,

said shaft being fixedly connected to said foot pad at a point in line with said heel portion whereby said shaft is normally inclined upwardly and forwardly,

a handle means connected to the upper end of said shaft,

said handle means including a portion cantileverly supported on said shaft and projecting anteriorly of said shaft and upwardly of said shaft,

said handle having a relatively wide intermediate portion inclined upwardly and forwardly so as to position the wrist of the user in radial deviation and extension and whereby the user's weight is distributed on the hypothenar eminence of the user's hand,

and said handle means is positioned on said shaft relative to said foot pad so that said handle means together with the arcuate sole portion of said foot pad is on the arc of a circle to simulate the movement of an anatomical foot by imitating the phases of a normal gait such as a heel strike, foot flat and toe off, during use, and

said foot pad and connected shaft and handle means being balanced so that said aid is naturally maintained in an upright position.

4,493,335

SHEAR VALVE

Richard R. Watson, Bellaire, Tex., assignor to Gilmore Valve Company, Bellaire, Tex.

Filed Jul. 15, 1982, Ser. No. 398,758

Int. Cl.³ F16K *3/18*

U.S. Cl. 137—116.3 **9 Claims**

1. A valve comprising a hollow body providing a valve chamber and having a supply port, a regulated port, and a vent port;

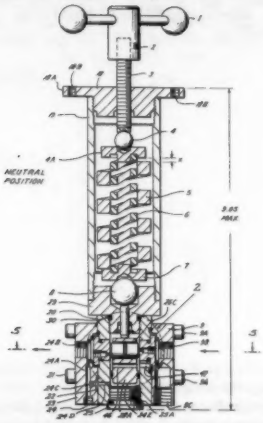
a valve member mounted for movement in said chamber of said body along a certain direction defining the valve axis;

said valve member having fluid passage means extending therethrough transversely of said axis;

mounting means mounting said valve member for said axial movement, said mounting means mounting said valve member for movement inside said body relative to said ports between

(a) a group of supply positions in which said regulated port and supply port are to varying degrees in communication through said passage means and said vent port is blocked off from said regulated port and supply port,

(b) at least one neutral position in which all three of said ports are blocked off from each other, and



(c) a group of vent positions in which said regulated port and vent port are to varying degrees in communication and said supply port is blocked off from said regulated port and vent port,

resilient means urging said valve member toward said group of supply positions, and

piston means to urge said valve member toward said group of vent positions,

said regulated port when said valve is in said supply positions communicating with said supply port solely through said passage means in said valve member without communicating with said chamber in the valve body in which said valve members moves, said chamber at all times being in communication with said vent port.

4,493,336

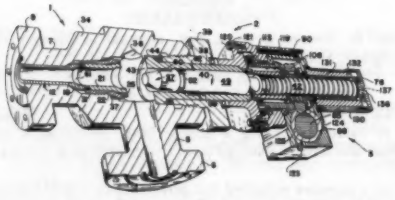
HYDRAULIC CHOKING DEVICE

Wesley E. Renfro, 2804 Broadmoor, Houma, La. 70360

Continuation-in-part of Ser. No. 160,972, Sep. 26, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,131

Int. Cl.³ F16K *1/08, 1/38, 1/42, 31/16*

U.S. Cl. 137—312 **7 Claims**



1. A hydraulic choking device to be installed on a high pressure fluid well member to control flow of fluids from wells which comprises:

(a) a choke housing assembly having:

(i) a choke housing body provided with an exit passageway having an exit opening at one end and a ball nose plug entrance opening at its opposite end, the passageway being provided with a cavity in its sidewall perpendicular to the passageway, and provided with a shoulder stud perpendicularly attached to the housing body and having a fluid entry passageway opening into the housing body passageway directly opposite the cavity, the shoulder stud being attachable to the fluid well member for the fluid entry passageway to receive the well fluids,

(ii) a wear sleeve assembly attached to the choke housing body passageway sidewall at the exit opening end and having an entry wear sleeve and a down stream wear sleeve, the entry wear sleeve having an outwardly flared opening to receive the fluids and direct them through the down stream wear sleeve which is also provided with a flared opening to receive the fluids and direct them through an opening of a ball nose plug seat;

(b) a choke actuator assembly having:

(i) a choke actuator body sealingly attached to said choke housing body and having a choke actuator passageway extending there through and aligned with said choke housing exit passageway,

(ii) sealing means positioned in circular grooves cut in the interior wall surface of said choke actuator body and extending out in sealing contact with said choke plug; and,

(c) a drive assembly having means to engage said choke plug body to move said choke plug in sealing contact with said wear sleeve assembly.

4,493,337

DEVICE ON A VALVE FOR SHUTTING OFF AND/OR CONTROLLING A FLOW OF LIQUID

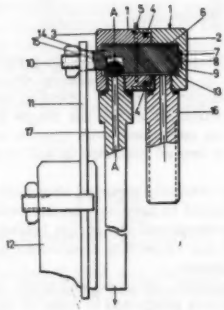
Egil S. Solvang, Postdamveien 15, N-Oslo 11, Norway

Continuation of Ser. No. 212,741, filed as PCT No. 80/00011, Apr. 1, 1980, published as WO 80/02171, Oct. 16, 1980, § 102(e) date Dec. 3, 1980, abandoned. This application Dec. 15, 1982, Ser. No. 450,147

Claims priority, application Norway, Apr. 6, 1979, 791170; 04011980, Apr. 1, 1980, PCT/NO80/00011

Int. Cl.³ F16K *15/04, 5/06*

U.S. Cl. 137—449 **2 Claims**



1. An assembly for controlling the flow of water in a toilet tank cistern comprising:

a water-tight two-piece valve box in said cistern having a fluid inlet communicating with a source of pressurized fluid, a fluid outlet communicating with the cistern, and a cylindrical chamber for supporting a valve body permitting fluid communication between said inlet and said outlet;

a cylindrical valve body supported for axial rotation within

said chamber by means of a dowel at one end thereof engaging a recess in said valve box and a journal at the other end thereof passing through a corresponding aperture in said valve box, said valve body being of sufficiently small diameter to permit fluid communication between said inlet and said outlet;

a valve assembly comprising: a blind hole in said valve body positioned for alignment with said fluid outlet; a displaceable ball valve freely movable within said blind hole; said blind hole being of a depth so that it will at least hold the entire ball and the walls of said blind hole being such that the liquid under pressure is free to flow into a space in the blind hole behind the ball; and a valve seat adapted to receive said ball valve and form a closure therewith, said valve seat being positioned at the point of intersection of said cylindrical chamber and said fluid outlet;

a float device within the cistern operatively associated with the journal of said cylindrical valve body so that the raising or lowering of said float device rotates said valve body about its axis within said chamber between a first position wherein said blind hole overlies said fluid outlet and a plurality of other positions wherein said bore is displaced from said first position;

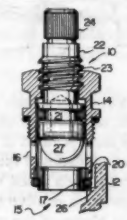
whereby when the valve body is displaced from its first position fluid enters the cylindrical chamber through the inlet, passes between the walls of the chamber and the cylindrical valve body, and exits from the chamber through the outlet, and when the valve body returns to its first position the low pressure in the outlet compared to the higher pressure in the chamber causes the ball valve to positively sit on the valve seat and close the outlet.

4,493,338

WASHERLESS FAUCET

Sigurdur G. Petursson, Mississauga, Canada, assignor to Waltec, Inc., Ontario, Canada

Filed Dec. 14, 1982, Ser. No. 449,770
Claims priority, application Canada, Jan. 27, 1982, 395006
Int. Cl.³ F16K *25/00*
U.S. Cl. 137—454.2 **5 Claims**



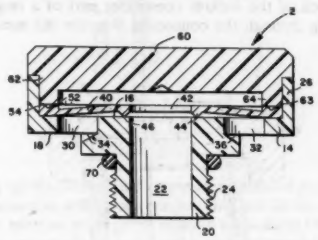
1. A removable cartridge for a fluid valve comprising a body member having an axial inlet opening at one end and at least one transverse outlet opening, a valve seat secured in said inlet opening, and valve means positioned in said body member for axial movement toward and away from said valve seat, said valve seat including a part extending beyond said body member adapted to receive an O-ring for providing a seal with a housing in which said cartridge is received, wherein said valve means includes a stem portion and a closure portion, said stem portion having male threads cooperating with female threads in said body member whereby rotation of said stem portion moves the valve means axially towards or away from said valve seat, said closure portion being rotatably mounted in said stem portion whereby said stem portion may be rotated without rotating said closure portion when it engages said valve seat, wherein said valve seat comprises an outer metallic portion having a first flat annular seat and an inner annular portion of resilient material providing a second seat and wherein said valve means has an outer flat annular portion engageable with said first seat and a second spherically shaped portion engageable with said second seat.

4,493,339

AIR VALVE FOR A BREATHING SYSTEM

George K. Porter, Jr., Maple Glen, Pa., assignor to Porter Instrument Company, Inc., Hatfield, Pa.

Filed May 5, 1982, Ser. No. 374,945
Int. Cl.³ F16K *17/164*
U.S. Cl. 137—510 **2 Claims**



1. An emergency air valve for a system for administering an anesthetic gas comprising:

a circular plate having a flat top surface and a bottom surface and a central opening therethrough for the passage of a gas, and

a resilient diaphragm overlying the top surface of the plate and having a central opening aligned with the opening in the plate,

said diagragm having an upper surface, a lower surface, an outer annular region and a flat intermediate region surrounding said central opening, said diaphragm capable of assuming a first undistorted position in which said intermediate region remains flat and a second distorted position in which said intermediate region is flexed, said diaphragm further includes a circular portion with a sharp edge depending from said lower surface and surrounding said central opening, said sharp edge adapted to contact the top of the plate surrounding the opening in the plate to effect a seal between the diaphragm and the top of the plate, said sharp edge being lower than the bottom surface of the diaphragm when said diaphragm is in its first position,

cap means mounted on the plate and bearing on the outer annular region of the diaphragm for securing the outer region of the diaphragm to the top surface of the plate at a substantial distance from said depending portion thereby distorting said intermediate region and urging the sharp edge toward the top surface of the plate and forming with the diaphragm a closed chamber above the diaphragm, said plate also forming with the diaphragm in its second distorted position a chamber below the diaphragm,

said plate having at least one other opening therethrough communicating the chamber below the diaphragm to the atmosphere.

4,493,340

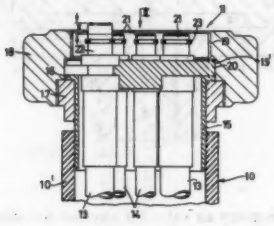
HYDRAULIC COUPLING

Walter Weirich, Dortmund, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,179
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1981, 3141475
Int. Cl.³ F16L *39/00*
U.S. Cl. 137—594 **8 Claims**

1. A hydraulic coupling for advanceable roof support assemblies and the like in an underground mine working, comprising,

in combination, a coupling device (11) and a connector (12), the coupling device comprising a casing (15, 17, 18), a holder (20) disposed within the casing, a plurality of plug pins (21, 22) held by the holder and housed within the casing, and the connector having a plurality of sockets (27, 28), the plug pins each being connected to a respective line (13, 14) of a multi-line hose (10) and the plug pins each being engageable within a socket of the connector to define a plurality of fluid passageways, wherein one of the passageways is provided with a non-return valve (30) for preventing fluid flow through said one passageway when the connector is separated from the coupling device, wherein each of the sockets constitutes part of a respective bore passing through the connector, wherein the non-return



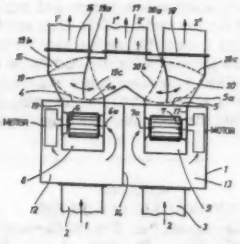
valve is positioned within a bore which defines part of the passageway associated with the valve, wherein one of the plug pins (22) is longer than the other plug pins and forms a valve-opening device which mates with the socket forming part of the passageway containing the non-return valve when the connector is joined to the coupling device, wherein said one plug pin constitutes an alignment pin for accurately aligning all of the plug pins within corresponding sockets of the connector, and wherein the non-return valve comprises an actuating plunger (37, 38) positioned within the bore which defines part of the passageway associated with the valve, the plunger being engageable with said one plug pin when the connector is joined to the coupling device.

4,493,341

BLOWER UNIT FOR AIR-CONDITIONING PLANT

Heinz Wieland, Waldenburg, Fed. Rep. of Germany, assignor to Wilhelm Gebhardt GmbH, Waldenburg, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,272
Int. Cl.³ F17D *1/04*
U.S. Cl. 137—597 **10 Claims**



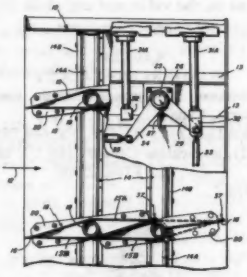
1. A blower unit comprising:
an outer housing defining a first and second chamber;
said outer housing having a first and second inlet and a first and second outlet being separated from each other and said inlets and outlets in communication with the respective first and second chambers;
first and second blowers having impellers and being fixedly mounted in an axially direction in said respective first and second chambers;
a distributor unit having a first and second inlet separated from each other and being connected to respective first and second separated outlets of said outer housing and having first, second, and third outlet connectors;
a first gate in said distributor unit for directing flow from said first inlet of said distributor unit into said first and third outlet connectors in an adjustable proportion; and
a second gate for directing flow from said second inlet of said distributor unit into said second and third outlet connectors.

4,493,342

DOUBLE LOUVER DAMPER

Lothar Bachmann, Auburn, Me., assignor to Bachmann Industries, Inc., Lewiston, Me.

Filed Oct. 24, 1983, Ser. No. 545,001
Int. Cl.³ E06B *7/092*
U.S. Cl. 137—601 **7 Claims**

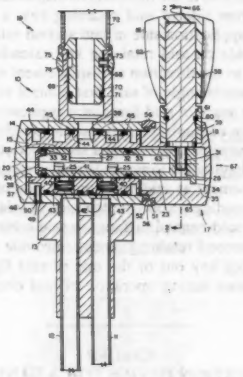


1. A double louver damper for a duct system to enable safe entry to be made therein, said damper including a rectangular frame dimensioned to be incorporated in the duct system, two series of the same number of blades of the same size and shape, means rotatably connecting each blade of each series to said frame with one series upstream relative to the other and with the axes of corresponding blades of the two series in the same plane, each blade in the form of an elongated diamond with its pivot axis at the center of the junction of first and second acutely angled portions including coplanar lengthwise and end sealing portions of the same radial extent and resiliently flexible sealing means, one for each series and attached to the frame to surround the flow path, and power operated means to pivot simultaneously all blades of both series between open and closed positions, in said closed position, the sealing portions of the blades of each series substantially in the same plane with the longitudinal and end sealing portions of adjacent blades overlapping and the corresponding portions of the remote blades and the end sealing portions of all blades in sealing engagement with the appropriate portions of the sealing means for that series, and the two series so spaced that in said open position the acutely angled first portions of one blade of each corresponding pair thereof so overlap the second portion of the other blade of that pair as to establish a closed streamlined figure the height of which is the maximum thickness of either blade.

4,493,343
SINGLE LEVER FAUCET ASSEMBLY

Don C. Arnold, Buffalo Grove, Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Indiana Brass, Inc., Frankfort, Ind.

Filed Apr. 13, 1983, Ser. No. 484,464
Int. Cl.³ F16K 11/02
U.S. Cl. 137—625.17 12 Claims



1. A single lever faucet assembly, comprising:

a faucet base adapted to receive therein hot and cold water supply lines;

a valve cartridge received within said faucet base, said valve cartridge including

(a) a valve body, said valve body defining therein a cavity, said valve body further defining a pair of inlets communicating between said valve body cavity and said hot and cold water supply lines and an outlet communicating between said valve body cavity and the exterior of said valve body, and

(b) a valve spool axially rotatable and slidable within said valve body cavity along a first axis, said valve spool defining therein a mixing chamber, said valve spool further defining a first pair of inlets and an outlet, said valve spool inlets and outlet communicating between said mixing chamber and the exterior of said valve spool,

said valve cartridge for controlling the flow rate and temperature of water discharged through said valve body outlet and supplied from said hot and cold water supply lines by selective registry, partial registry or non-registry of said valve spool inlets with said valve body inlets;

a faucet spout mounted on said faucet base in such manner that said faucet spout is in flow communication with said valve body outlet;

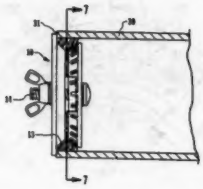
a faucet control lever; and

a linking means associated with said faucet control lever and said valve spool for linking said faucet control lever and said valve spool in such manner that the temperature and flow rate of water exiting said spout is independently controlled by separate-patterned movement of said faucet control lever, said linking means further for providing said faucet control lever with a square operating pattern of movement, the temperature of water exiting said spout being regulable by uniform movement of said faucet control lever at any set flow rate.

4,493,344
MECHANICAL PLUG DEVICE

Allen D. Mathison, Richfield; Dale K. Nelson, Minneapolis, and Lloyd G. Cherne, Edina, all of Minn., assignors to Cherne Industries, Inc., Minneapolis, Minn.

Filed Apr. 13, 1983, Ser. No. 484,172
Int. Cl.³ B65D 39/12
U.S. Cl. 138—89 7 Claims



1. A mechanically hand operable mechanical plug device for the removable sealing of a conduit end, said device comprising:

(a) a narrow, elastomeric radially expandable O-ring having an essentially narrow outer circumferential surface for engaging the interior surface of a conduit, and an inner circumferential V-shaped cross section having inclined surfaces of a predetermined slope,

(b) spacially parallel rigid plate members having interiorly facing tapered shoulders of the same said predetermined slope to engage the inclined surfaces of the O-ring, said narrow O-ring having a maximum body width of approximately twice the width of one said interiorly facing shoulders and having a circumferential outer surface width equal to or less than said O-ring body width, said plate members further comprising an inner circular plate member and an outer circular plate member, said inner plate member having a plurality of rib members extending radially from its tapered shoulders for gripping the inclined surface of the O-ring to prevent relative rotational movement between the inner plate member and the O-ring, said predetermined slopes of the O-ring inclined surfaces and the tapered shoulders of the inner and outer plate members being dependent upon the diametric dimensions of the O-ring and being in a range of 40 to 60 degrees as the diameter of the plug device varies to engage conduits of an inside diameter of approximately 1.5 to 8.0 inches, and,

(c) hand adjustable lateral force means operable on the parallel plate members, whereby, subsequent to the placement of the plug device into a conduit end, the positive adjustment of the lateral force means causes the sloped opposing shoulders to impart lateral forces to the inclined surfaces of the O-ring to, thereby, cause it to expand outwardly to seal a conduit, and, whereby, said narrow O-ring member reaches its sealing diameter before the inner and outer plate members make contact.

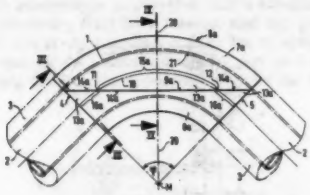
4,493,345
THERMAL INSULATION JACKET HAVING CURVED TUBE OR PIPE

Frank Ruechel, Ladenburg, Fed. Rep. of Germany, assignor to Isover Saint-Gobain, Neuilly-sur-Seine, France

Continuation of Ser. No. 255,338, Apr. 17, 1981, abandoned.
This application Jul. 22, 1983, Ser. No. 516,092
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 3015013
Int. Cl.³ F16L 59/02
U.S. Cl. 138—178 1 Claim

1. A jacket having a central axis and two opposite end surfaces with said jacket being formed of a thermal insulating material defined by two shell portions which interfit and register along individual partitioning surfaces to provide a complete

thermal insulation enclosure, said jacket having a curved outline along a plane of curvature and adapted to be received on a tube having a similarly curved outline and an axis both located in said plane of curvature and substantially coincident with the central axis of said jacket wherein said partitioning surfaces of each shell portion extend toward said tube in a direction substantially perpendicular to said plane of curvature and follow a path from one end surface of said jacket to the



other end surface to intersect said coincident axes at two locations thereby to define at least one region in each shell portion which extends around the periphery of said tube throughout a distance greater than 180° and wherein the partitioning surface of each shell portion is defined by the surface of a circular cylinder in which the radius is greater than the radius of curvature of said tube and is substantially infinite such that each partitioning surface defined thereby is substantially planar.

4,493,346

COUPLING ARRANGEMENT USABLE IN A TEXTILE MACHINE

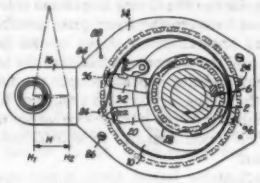
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG

Filed Dec. 30, 1981, Ser. No. 335,878

Claims priority, application Switzerland, Jan. 9, 1981, 103/81

Int. Cl.³ G05G *1/00*; F16D *13/04, 11/06*; D03C *1/00*

U.S. Cl. 139—76 **20 Claims**



1. Coupling arrangement such as for a textile machine, comprising a drive shaft capable of intermittent rotation about the axis thereof, an eccentric hoop extending around said drive shaft, a connecting member extending around said drive shaft with said eccentric hoop located between said drive shaft and said connecting member and said connecting member being supported on said eccentric hoop, a coupling key movably guided on said eccentric hoop for movement in the direction of displacement thereof approximately radially of said drive shaft, a first coupling recess associated with said drive shaft, a second coupling recess associated with said connecting member with said first coupling recess being located radially inwardly from said second coupling recess, a shifting member arranged to displace said coupling key alternately between engagement with said first coupling recess or said second coupling recess, lead cams for guiding said coupling key and retaining said coupling key in the one of said first and second coupling recesses into which it is displaced, wherein the improvement comprises a retaining key movably guided on said eccentric hoop along a rectilinear direction of displacement extending approximately in the radial direction relative to said drive shaft and being movable independently of said coupling key, said retaining key relative to the axis of said drive shaft being spaced angularly from and being separate from said coupling key, a first retaining recess associated with said drive shaft and spaced angularly from said first coupling recess, a second retaining recess associated with said connecting member and spaced angularly from said second coupling recess, said first retaining recess being located radially inwardly from said second retaining recess, a first force application side on said retaining key extending at an acute angle relative to the direction of displacement of said retaining key, a corresponding first force application side in said first retaining recess, a second force application side in said retaining key having the same acute angle relative to the direction of displacement as said first force application side of said retaining key, a corresponding second force application side in said second retaining recess, a first control side on said retaining key extending at an acute angle relative to the direction of displacement of said retaining key with the acute angle of said first control side being larger than the acute angle of said first force application side relative to the direction of displacement, a corresponding first control side in said first retaining recess, a second control side of said retaining key having the same acute angle relative to the direction of displacement as said first control side of said retaining key, a corresponding second control side in said second retaining recess and said control surfaces on said retaining key and in said first and second retaining recesses provide a displacement of said retaining key out of the one of said first and second retaining recesses during operation of said coupling arrangement.

4,493,347

WEFT INSERTION DEVICE FOR A BAND-GRIPPER WEAVING MACHINE

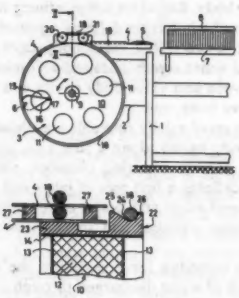
Friedrich Lutz, Durnten, Switzerland, assignor to Ruti Machinery Works, Ltd., Ruti, Switzerland

Filed Sep. 9, 1982, Ser. No. 416,261

Claims priority, application Switzerland, Oct. 14, 1981, 6559/81

Int. Cl.³ D03D *47/00*

U.S. Cl. 139—449 **11 Claims**



1. A weft insertion device for use on a band-gripper weaving machine, said device comprising a driven, rotationally oscillating band wheel, a flexible insertion band having a gripper head and executing an oscillating movement into and out of a warp shed as the band unwinds from and winds onto an outer circumference of the band wheel respectively, guide means for preventing the insertion band from separating from the outer circumference of the band wheel, said guide means being a cable cut to an appropriate, fixed length and adapted to press against an outside surface of the insertion band, both ends of the cable being anchored to the band wheel, the circumference of the band wheel being smaller than a maximum excursion of the gripper head, the insertion band being wound around the circumference of the band wheel to the extent of more than 360° when the gripper head is in a position in which the gripper head is fully and maximally withdrawn from the warp shed,

the cable pressing against the entire instantaneous length of the insertion band which is wound onto the band wheel, and in a winding overlap region of the insertion band, in which region two layers of the band are wound onto the band wheel, the outer layer of the insertion band rests on a first cable layer which presses against the inner layer of the insertion band, and said outer layer being held by a second cable layer on an outer surface of the outer band layer.

4,493,348

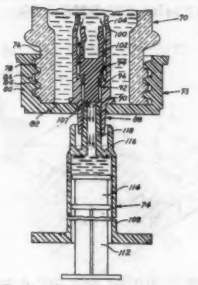
METHOD AND APPARATUS FOR ORALLY DISPENSING LIQUID MEDICATION

Joseph J. Lemmons, Colorado Springs, Colo., assignor to PUR-/ACC Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 278,170, Jun. 29, 1981, abandoned. This application Jan. 5, 1983, Ser. No. 455,877

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—1 **5 Claims**



3. A method for orally providing a patient with a desired amount of liquid medication, comprising the steps of:

providing a container having a neck with a threaded outer wall, said container housing liquid medication to be taken orally by the patient;

providing an integral one-piece coupling device having a bore, said coupling device including a skirt having an inner wall comprising threads;

matingly engaging said skirt and said neck using said threads of said inner wall and said threaded outer wall;

providing a valve member in said bore, said valve member being resiliently movable in a longitudinal direction between a first position wherein said valve member is in an open state and a second position wherein said valve member is in a closed state;

providing a syringe including a barrel and a plunger, said barrel having a tip extending from an end of said barrel;

inserting said tip of said syringe barrel into said bore;

contacting said valve member using said syringe barrel tip;

causing said valve member to move to its first position by moving said valve member in the longitudinal direction;

moving said plunger relative to said syringe barrel to cause said liquid medication to be received into said tip and then into said syringe barrel;

obtaining a desired amount of said liquid medication in said syringe barrel;

discontinuing the obtaining of said liquid medication into said syringe barrel; and

transferring said desired amount of liquid medication into the mouth of the patient.

4,493,349

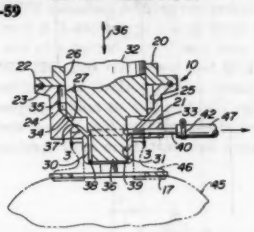
LIQUID FILLING MACHINE

Daniel P. Pomponio, Sr., Cherry Hill, N.J., assignor to Precision Automation Co., Inc., Cherry Hill, N.J.

Filed Mar. 10, 1983, Ser. No. 473,779

Int. Cl.³ B65B *31/04*

U.S. Cl. 141—59 **4 Claims**



1. In a liquid filling machine, the combination comprising: a filling head for passing fill liquid to a container, a fill valve in said head for opening and closing said head to the passage to fill liquid, an outlet on said head downstream of said fill valve for hermetic communication with the container, a fluid conduit communicating with the interior of the filling head between said fill valve and outlet, and a vacuum source connected to said conduit for evacuating the container and filling head upstream to said fill valve prior to filling of the container, said filling head comprising an internally hollow member having an opening defining said outlet, said fill valve comprising a valve seat in said hollow member extending about said opening, and a valve member movable into and out of sealing engagement with said valve seat, said valve seat comprising a generally conical internal surface in said hollow member converging toward said opening for increasing the speed of fill liquid toward said opening, and said fluid conduit comprising a tubular member extending inwardly through and beyond said conical surface and terminating in an end surface lying in a plane generally longitudinally of the axis of said conical surface for effective protection of said end surface from fill liquid moving at increased speed and deflected by said tubular member away from said end surface.

4,493,350

DEVICE FOR REMOVING AIR FROM HERMETIC, AUTOMATICALLY EMPTYING CENTRIFUGE DRUMS

Alfons G. Beikel, Ahlen, and Harald Jarosch, Warendorf, both of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,784

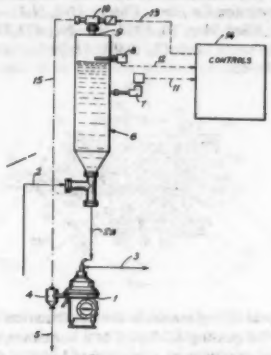
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1982, 3213618

Int. Cl.³ B65B *31/04, 3/26*

U.S. Cl. 141—65 **7 Claims**

1. In a device for removing air from a system having a supply line and a removal line and including an air-removal valve in the supply line, the improvement comprising: an air-removal reservoir connected to the supply line and having a manometric switch and a level-sensitive switch thereto and having a head portion, wherein the air-removal valve is connected to the head portion of the reservoir and control means connected to the switches and the air-removal valve for opening the air-removal valve when the pressure in the reservoir exceeds a predetermined level and closing the air-removal

valve when the pressures drops below the level and maintaining the valve closed whenever the level of the liquid in the



reservoir reaches the level of the level-sensitive switch regardless of the pressure level in the reservoir.

4,493,351

APPARATUS FOR COPY-MACHINING A WORKPIECE

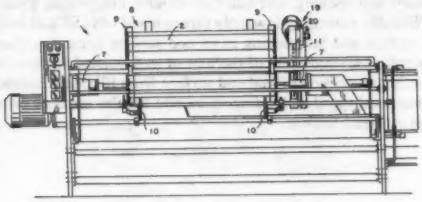
Erich Schmidt, Mauerbach, Austria, assignor to MZW Maschinenfabrik Zackermann Pachtgesellschaft mbH, Austria

Filed Sep. 30, 1982, Ser. No. 429,433

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138982

Int. Cl.³ B27C *5/00*; B23Q *35/04*

U.S. Cl. 144—3 R **9 Claims**



1. In an apparatus for copying-machining a workpiece, including a disk miller assembly acting as a shaping tool and a grinding belt extending between return pulleys and acting as a surface finishing tool assembly, both said tool assemblies being mounted on pivot arms for pivotal displacement about pivot axes and adapted to be advanced along a rotating workpiece in sequence under the control of scanner means scanning a model, said disk miller rotating about an axis extending parallel to the rotary axis of the workpiece, the improvement wherein said grinding belt rotates between said pulleys adjacent to said disk miller with the axis of the pulleys being parallel to the rotary axis of the workpiece and with the pivot axis of the pivot arm of the grinding belt being co-axial with the pivot axis of the pivot arm of the disk miller.

4,493,352

WOOD CHIP SHAVER

Matti Jaakonmäki, and Pentti Raura, both of Valko, Finland, assignors to Rauma-Repola Oy, Finland

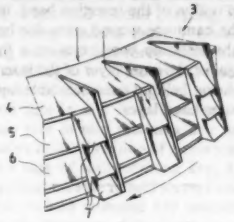
Filed Jan. 10, 1983, Ser. No. 456,744

Claims priority, application Finland, Jan. 12, 1982, 820097

Int. Cl.³ B27C *1/00*

U.S. Cl. 144—162 R **3 Claims**

1. Wood chip shaver comprising a rotor, a vertical drive shaft for said rotor, said rotor being rotatable about said drive shaft, cutting blades disposed on a circle around the outside of said rotor, chip guide means carried by said rotor, and a plural-



ity of chip guide plates carried by said rotor, said chip guide plates being disposed on top of each other.

4,493,353

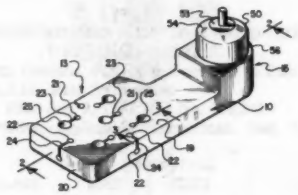
NAIL GUIDE AND SET

John Thomas, 2984 Canna St., Thousand Oaks, Calif. 91360

Filed Feb. 15, 1984, Ser. No. 580,564

Int. Cl.³ B25C *3/00*

U.S. Cl. 145—46 **18 Claims**



1. A tool for use in driving nails into a workpiece comprising:

(a) a base member formed of resilient material having a generally flat bottom surface for being supported on the workpiece;

(b) guide means formed of rigid material in the base member having a central opening for receiving a nail for movement through the bottom portion of the central opening;

(c) a rigid cap member on the base member above the guide means having an aperture through it; and

(d) impact transmission means in the aperture of the cap means and extending into the opening in the guide means above the nail for transmitting impact from a hammer to the nail.

4,493,354

TIRE CHAIN

Henry G. St. Pierre, 311 E. Mountain St., Worcester, Mass. 01606

Filed Feb. 22, 1984, Ser. No. 582,294

Int. Cl.³ B60C *27/06*

U.S. Cl. 152—242 **10 Claims**

1. Tire chain, comprising:

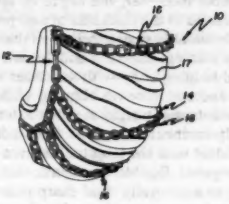
(a) two spaced, parallel side chains,

(b) a plurality of cross chains joining the side chains at spaced intervals,

(c) a hook element on each end of each cross chain, and

(d) a junction link in each side chain to which each hook element is connected, each hook element consisting of a bight lying in a first plane and two legs overlying the bight having free ends that are spaced from the bight a distance

less than the thickness of the junction link, the junction link having two spaced parallel notches to permit the



entry of the junction link into the hook element between the said free ends and the bight.

4,493,355

VEHICLE TIRE

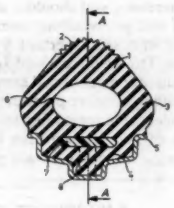
Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,356

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101408

Int. Cl.³ B60C 7/00, 7/12

U.S. Cl. 152—329 8 Claims



1. A vehicle rim and vehicle tire consisting of a base, side walls and a tread merging with one another, characterized in that the tire has a continuous encircling empty space of substantially constant cross-section throughout located between the base and tread, the cross-section of the tread increases in thickness towards its zenith so that the moment of inertia of the tread is at least six times greater than that of the side walls, and the base of the tire inwardly of the encircling empty space contains an annular reinforcement of plastic material hardened after the tire is fitted on the rim to prevent the tire from being removed from the rim.

4,493,356

ROLLER SHUTTER INSTALLATION AND SAFETY APPARATUS

Bruno Hermann, deceased, late of Keltern-Dietlingen, Fed. Rep. of Germany (by Eleonore Hermann, heir), and Axel Hermann, Pforzheim, Fed. Rep. of Germany, assignors to Hermann Haus GmbH, Pforzheim, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,680

Int. Cl.³ E06B 9/209

U.S. Cl. 160—133 28 Claims

1. In a roller shutter installation comprising

a roller shutter comprising a plurality of parallel horizontal slats, which are adapted to be pulled apart,

two channel-shaped shutter rails, each of which has mutually opposite legs and which are disposed on opposite sides of said roller shutter and adapted to receive ends of each of said slats, each of said rails having a vertical lower portion in which said ends of said slats are adapted to slide down to a position in which said shutter is in a closed position,

a safety apparatus for locking said roller shutter against being pushed up from said closed position, said safety apparatus comprising a locking device, which is connected at a first mounting point to one end of a first one of said slats and at a second mounting point to the corresponding end of a second one of said slats, which is disposed below said first slat when said shutter is in said closed position, said locking device being arranged to exert a wedging action on said mutually opposite legs of the adjacent one of said shutter rails in response to an upward pushing force exerted on said second slat when

said shutter is in said closed position, whereas said locking device permits said shutter to be raised from said closed position by an upwardly directed pulling force exerted on said slats and tending to move said first and second slats apart,

the improvement residing in that said locking device comprises a chain having a lower end portion connected to said second shutter slat at said second mounting point and

said chain consists of a plurality of flat links, each of which has mutually opposite, sharp end portions and is pivoted to adjacent ones of said links on respective axes which extend substantially in the longitudinal direction of said slats, each of said links being movable relative to said adjacent links substantially only about said axes.

4,493,357

SUSPENSION SYSTEM FOR SUSPENDING A VENETIAN BLIND ASSEMBLY

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

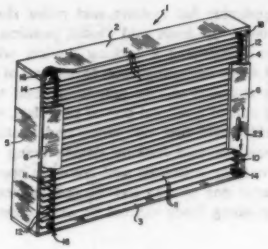
Filed Dec. 2, 1982, Ser. No. 446,386

Int. Cl.³ E06B 9/26

U.S. Cl. 160—174 10 Claims

1. A suspension system for suspending a venetian blind assembly comprising a plurality of slats between two fixed frame members positioned at opposite ends of the assembly and extending parallel to the slats where said system includes at least two slat support means individually and tiltably supporting said slats, a pivot member connected to at least one end of each slat support means, and a hanger means connecting at least one pivot member connected with a single slat support means to a fixed frame member, characterized in that said hanger means is pivotally connected at one end to a fixed frame

member and pivotally connected at its other end to a pivot member whereby said pivot member is pivotal about two axes



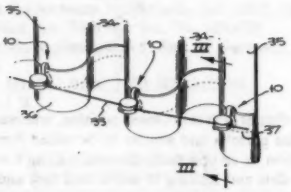
with respect to the fixed frame member with said two axes extending substantially parallel to the axes of tilt of said slats.

4,493,358

APPARATUS AND METHOD FOR RETAINING PLEATS IN HANGING DRAPERIES

Jeff A. Jacobson, 22 Woodbgrove, Irvine, Calif. 92714

Filed Apr. 17, 1981, Ser. No. 255,332
Int. Cl.³ A47H *13/14*; F16G *11/00*
U.S. Cl. 160—349 R **1 Claim**



1. Apparatus for maintaining a plurality of pleats formed in a hanging drapery hanging from a drapery rod or the like a predetermined distance apart, each of said pleats having a portion folded up from the bottom of said drapery having a hem comprising:

an elongated resilient cord extending along substantially the bottom of said pleats generally normally to the longitudinal axis of said pleats and generally parallel to the drapery rod from which the drapery hangs;

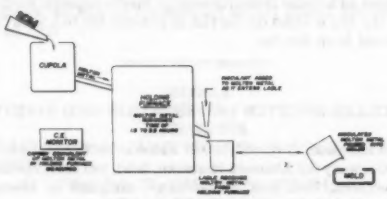
a plurality of fasteners coupled to both said cord and successive ones of said pleats at spaced locations along said cord, each of said fasteners including a generally circular pin receiving member having an aperture therethrough, an elongated first flexible member inter-connecting said pin receiving member to a generally circular first body member, said first body member having a shallow groove extending across the face thereof in a direction generally normal to the longitudinal axis of said first flexible member, at least one cord piercing element disposed in said groove, at least one protuberance receiving cavity also disposed in said first body member, an elongated second flexible member interconnecting said first body member to a second generally circular body member, said second elongated flexible member having its longitudinal axis coincident with the longitudinal axis of said first flexible member and being substantially shorter in length than said first flexible member, said second body member also having a shallow groove extending across the face thereof in a direction generally normal to the longitudinal axes of said first and second elongated flexible members, said last mentioned shallow groove also having at least one cord piercing element therein, and said second body member having at least one protuberance of a configuration generally the same as said protuberance receiving cavity and receivable therein when the face of said first and second body members are brought together by folding of said second flexible memeber, the depth of said cavity being generally related to the thickness of said protuberance and adapted to releasably snap together so that, when brought together by folding, said first and second body members form a cord holding body with said faces abutting against each other and said grooves aligning with each other, an elongated substantially rigid member extending from said second body member having its longitudinal axis essentially coincident with the longitudinal axes of said first and second elongated flexible members, said rigid member terminating in a generally rigid sharp point having a generally triangular cross-section with the apex thereof extending away from said rigid member and the base thereof being adjacent said rigid member having a width greater than the width of said rigid member thereby forming a shoulder, each of said first flexible members being folded over the top of each hem of said successive pleat so that each of said pin receiving members is disposed between the inside of the fold of said pleat and said drapery, each said fastener being folded about said second flexible member with said faces abutting against each other and said protuberance entering said cavity, said elongated resilient cord being disposed in said aligned grooves with said elements piercing said cord, the overall diameter of said aligned grooves being generally the same as the diameter of said cord, said sharp point piercing the fold hem of each of said pleats from the outside of said fold to the inside thereof and passing through said apertures in each of said pin receiving members, said shoulder abutting against the furthest side of said pin receiving member to retain said sharp point through said aperture yet permitting said sharp point to be removed from said aperture by pushing it in a reversed direction out of said aperture, the resilience of said pin receiving member permitting the same so that each of said fasteners are removably secured to successive pleats and each of said fasteners can be relocated along said cord to change the depth of said pleats.

4,493,359

METHOD FOR MAKING CAST IRON ENGINE BLOCKS AND THE LIKE

Joseph A. Bostater, Port Huron, Mich.; Angus J. MacGregor, Corunna, and Aaron A. Gesicki, Sarnia, both of Canada, assignors to American Motors (Canada) Inc., Brampton, Canada

Filed Jul. 17, 1981, Ser. No. 284,028
Int. Cl.³ B22D *27/20*
U.S. Cl. 164—58.1 **5 Claims**



1. A method for manufacturing machinable grey iron castings comprising: continuously making molten grey iron in a cupola or the like metal remelting furnace, feeding the molten grey iron into a holding furnace, withdrawing molten grey iron from the holding furnace, inoculating the withdrawn molten grey iron with a nucleating agent and then pouring the inoculated molten grey iron, at a temperature of from about 1400° C. to 1500° C. into cored molds for cooling and solidification thereof thereby to form thin-walled castings for use as

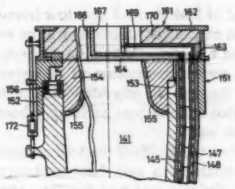
engine blocks and the like with nominal wall thicknesses of about 0.150 inch; the molten grey iron in said holding furnace being brought to and maintained at a relatively uniform temperature throughout its mass of from about 1420° C. to 1560° C. and from about 20° C. to 60° C. higher than the temperature of the molten metal when it is poured into the cored molds, the amount of molten grey iron in said holding furnace being from one and one-half to two and one-half times the amount withdrawn per hour from the holding furnace whereby the residence time of the molten grey iron in the holding furnace is from one and one-half to two and one-half hours; and the carbon equivalent of the molten grey iron in said holding furnace being monitored and being maintained below that desired for the molten grey iron when it is poured into the molds, the amount of nucleating agent with which the withdrawn molten grey iron is inoculated being such as to raise the carbon equivalent of the molten grey iron to that desired when the molten grey iron is poured into the cored molds.

4,493,360

APPARATUS FOR ROTARY CASTING INGOTS

Hiroyuki Takahashi, Yokosuka, and Tomohiro Ogata, Ohiso, both of Japan, assignors to Kanto Special Steel Works Ltd., Japan

Continuation of Ser. No. 228,810, Jan. 27, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,510
Claims priority, application Japan, Jan. 27, 1980, 55-8017
Int. Cl.³ B22D *13/00*
U.S. Cl. 164—286 **8 Claims**



1. An apparatus for making ingots which comprises:
(a) a substantially cylindrical mold made of metal, including a vertical wall, said mold having an opening in the bottom thereof,
(b) a stool provided with a runner in which said mold is placed, said runner communicating with said bottom opening of said mold,
(c) a rotary table on which said stool is mounted, said rotary table being rotatable about a vertical axis and being equipped with means for rotating said table,
(c) a vertical fountain detachably mounted along its length on the outer surface of said vertical wall of said mold, said fountain communicating with said runner,
(d) said mold and said vertical fountain having respective outer walls having flat surfaces, and said fountain being fastened to said mold by bolts in such a manner that their respective flat surfaces closely contact each other; and
(e) a metal receiver communicating with the top of the fountain, the entrance of said receiver being vertically disposed and said entrance to said receiver, said stool and said rotary table all having a common vertical axis of rotation.

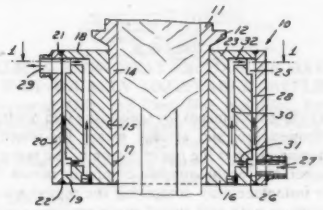
4,493,361

CONTINUOUS CASTING APPARATUS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Dec. 7, 1981, Ser. No. 327,958
Int. Cl.³ B22D *11/124*
U.S. Cl. 164—443 **15 Claims**

11. In a continuous casting apparatus wherein molten metal flows through a die progressively and is solidified in the die and withdrawn from the die, a cooling assembly comprising:
a tubular cooling sleeve having an external surface and an internal surface, said internal surface being tapered and adapted to be complementary to an external tapered surface of the die and in substantial intimate surface contact with the external tapered surface of the die,
an annular cooling shell surrounding said cooling sleeve and having an outer surface and an inner surface thereof spaced from said sleeve, said cooling sleeve being formed with upper and lower flanges engaging the inner surface of said shell to define a circumferentially extending cooling chamber having an upper end,
said cooling sleeve being formed with an annular groove on the outer surface thereof at the upper and lower ends thereof, respectively, defining an upper annular plenum and lower annular plenum communicating with the upper end and the lower ends of said chamber,



at least one inlet to said lower plenum,
at least one outlet from said upper plenum,
said inlet and said outlet being spaced axially with the outlet being nearest the inlet end of the die into which the molten metal flows,
said cooling sleeve having a plurality of axially extending circumferentially spaced passages positioned intermediate the inner and outer surfaces thereof and having upper and lower ends and a first set of radial passages extending from the lower plenum to the lower ends of the axial passages and a second set of radial passages extending from the upper end of said axial passages to said upper plenum and, in turn, said outlet, a radial passage of said second set being provided for the upper end of each axial passage and a radial passage of said first set being provided for the lower end of each said axial passage.

4,493,362

PROGRAMMABLE ADAPTIVE CONTROL METHOD AND SYSTEM FOR DIE-CASTING MACHINE

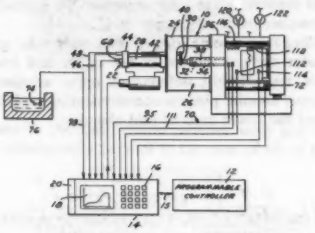
James I. Moore, Zeeland, and Philip J. Van Huis, Holland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 27, 1982, Ser. No. 382,528
Int. Cl.³ B22D *17/32*
U.S. Cl. 164—457 **8 Claims**

1. A method of operating a pressure molding machine of the type having a material injection chamber with an outlet region leading to a die cavity runner which directs molten material to a die cavity for solidification during a dwell period and in which chamber an injection plunger reciprocates to inject molten material comprising the steps of selecting a predetermined desired temperature for molten material in the outlet region measuring the actual temperature of the molten material in the outlet region of the injection chamber just prior to a plunger shot; comparing the actual temperature and the previously established desired temperature and, if the actual temperature is below the desired temperature increasing the shot speed of the plunger accordingly and if the temperature is higher than the desired temperature reducing the shot speed of the plunger and if the actual temperature is at predetermined out-of-limits range from the desired temperature so that the

shot speed cannot be compensated, terminating the machine plunger shot cycle.

5. A control system for a machine of the type having a material injection chamber with an outlet region leading to a die cavity runner which directs molten material to a die having a cavity for solidification during a dwell period and in which chamber an injection plunger reciprocates to inject molten material comprising a programmable computer means, means selecting a predetermined desired temperature for molten material in the outlet region, said programmable computer



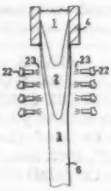
means including store means for registering said predetermined desired temperature, and sensing means for measuring the material temperature at the outlet region of the material injection chamber; the programmable computer means including means for instantaneously comparing the sensed actual material temperature with said stored predetermined desired temperature for molten material in the outlet region and either increasing or decreasing a shot speed command signal to adjust the shot speed of the machine in accordance with the difference between the actual temperature and selected temperature.

4,493,363

METHOD AT CONTINUOUS CASTING OF STEELS AND METAL ALLOYS WITH SEGREGATION TENDENCY AND APPARATUS FOR CARRYING OUT THE METHOD

Hasse Fredriksson, Stockholm, and Lars Tiberg, Fagersta, both of Sweden, assignors to Jernkontoret, Stockholm, Sweden

Filed Jul. 26, 1977, Ser. No. 819,214
Claims priority, application Sweden, Jul. 30, 1976, 7608617
Int. Cl.³ B22D *11/12, 11/124*
U.S. Cl. 164—476 **2 Claims**



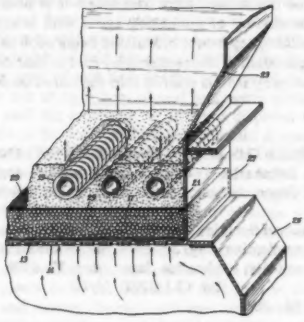
1. A method of preventing the formation of segregations in continuous casting of steel and metal alloys in a strand cast from molten metal, where the cast strand is formed from a molten metal introduced, through a casting chill and undergoing solidification to a rectangular cross-section solid strand, characterized by physically deforming the cast strand by action on its external surface, in successive steps from just below the chill to a point where the strand is fully solidified, controlling said deforming so that the cross-section area of the strand is reduced to an extent in each of said steps corresponding to the solidification shrinkage and cooling shrinkage of the strand at the position of said step, said physically deforming obtained by the action of subjecting the broad sides of said cast rectangular strand at the central portions thereof to forced cooling after it has left the chill used for casting, said deforming steps substantially avoiding upward and downward transport of melt in the strand from the chill to the point where the strand is fully solidified.

4,493,364

FROST CONTROL FOR SPACE CONDITIONING

Robert A. Macriss, Deerfield; Jaroslav Wurm, North Riverside, and Vincent M. Huang, Skokie, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 30, 1981, Ser. No. 325,970
Int. Cl.³ F28D *13/00*
U.S. Cl. 165—1 **48 Claims**



26. A method of frost control on a low temperature outdoor ambient air heat exchanger functioning as an evaporator in the heating mode of a space conditioning apparatus comprising:

passing heat exchange medium of said space conditioning apparatus through an extended surface heat exchanger, said extended surface heat exchanger immersed in a fluidizable bed; and

passing said low temperature outdoor ambient air in thermal exchange relation to said heat exchanger at sufficient velocity to fluidize said bed thereby enhancing heat exchange between said heat exchange medium and ambient air and reducing tendency of frost formation by physical vibration and abrasive action.

46. A method of frost control on a low temperature outdoor ambient air heat exchanger functioning as an evaporator in the heating mode of a space conditioning apparatus comprising:

passing heat exchange medium of said space conditioning apparatus through an extended surface heat exchanger, said extended surface heat exchanger immersed in a fluidizable bed; and

passing said low temperature outdoor ambient air in thermal exchange relation to said heat exchanger through a plurality of non-fluidizable solid desiccant particles comprising a support bed on top of a distributor means for supporting said non-fluidizable support bed and for admitting and distributing said ambient air throughout said fluidizable bed at sufficient velocity to fluidize said bed thereby enhancing heat exchange between said heat exchange medium and ambient air and reducing tendency of frost formation by physical vibration and abrasive action.

4,493,365

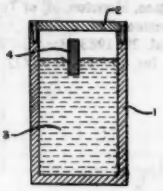
HEATING DEVICE WITH HEAT STORAGE

Francis Ortega, Brunoy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1983, Ser. No. 494,146
Claims priority, application France, May 18, 1982, 82 08686
Int. Cl.³ F28D *17/00;* **F24H** *7/00;* **C09K** *5/00*
U.S. Cl. 165—10 A **5 Claims**

1. A heat storage device, which comprises a hermetically sealed metallic container; one or more molten alkali metal

fluorides and/or alkaline earth metal fluorides included in the metallic container; and a material having a carbon basis also included in the metallic container, said carbon-basis material



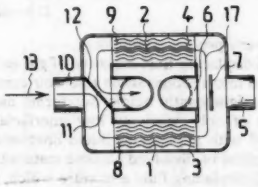
reacting with any oxygen present in the metallic container and thereby preventing corrosion of the metallic container by the molten fluorides.

4,493,366

MEANS FOR RECOVERING HEAT FROM A ROOM SPACE, AND FOR VENTILATION

Heinz Ekman, Kirkkonummi, Finland, assignor to Verdal Maskinverksted A/S, Finland

Filed Nov. 2, 1982, Ser. No. 438,463
Claims priority, application Finland, Nov. 3, 1981, 813454
Int. Cl.³ F28D *17/00*; F24F *7/00*
U.S. Cl. 165—54 **2 Claims**



1. Means for recovery of heat from air from a room and for ventilation of said room, comprising at least two heat accumulators to which outgoing air from said room delivers its heat and from which incoming air takes heat, a room air outflow duct and a room air inflow duct, each accumulator having one end thereof connected to said outflow and inflow ducts, the direction of flow of air in said ducts being always the same, a flap for controlling the flow of air in said outflow and inflow ducts, a fresh air intake duct and an outgoing exit duct, each accumulator having the opposite end thereof connected to said fresh air intake duct and said outgoing duct, the direction of flow of air in said fresh intake and outgoing exit ducts being always the same, and a second flap for controlling the flow of air in said fresh air intake and outgoing exit ducts, said flaps being synchronized with each other so that the flap associated with the room space outflow duct and inflow duct turns before the second flap, at least that much earlier that the fresh incoming air will circulate a little while through both heat accumulators and escape back to the outdoor atmosphere.

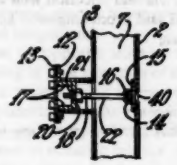
4,493,367

REPAIR OF DOUBLE SHELL HEAT EXCHANGERS

Eugene M. Haynes, Hebron, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 237,201, Feb. 23, 1981, Pat. No. 4,430,788. This application Oct. 24, 1983, Ser. No. 544,927
Int. Cl.³ F28F *11/00*
U.S. Cl. 165—72 **5 Claims**

1. In a double shell apparatus comprising an inner shell and an outer shell with an annular space therebetween, the inner shell having an aperture therethrough, the improvement comprising an access opening in the outer shell, frame means positioned proximate said access opening, first cover means adapted to seal said aperture, said first cover means affixed to an extension means, said first cover means positioned in



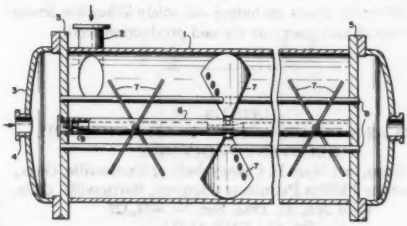
contact with said inner shell and said extension means being biased against said frame means, and second cover means positioned proximate said access opening.

4,493,368

HELICAL FLOW HEAT EXCHANGER HAVING INDIVIDUALLY ADJUSTABLE BAFFLES

Rolf Gronnerud, Oslo, and Einar Boe, Notodden, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Jun. 8, 1982, Ser. No. 386,417
Claims priority, application Norway, Jun. 22, 1981, 812113
Int. Cl.³ F28F *9/22*
U.S. Cl. 165—159 **8 Claims**



1. A helical flow heat exchanger comprising:
- a shell having an inlet and an outlet for circulating a medium through said shell;
- tube sheets fixed to said shell adjacent opposite ends thereof;
- a central pipe fixed to said tube sheets and extending through said shell;
- a plurality of elongated tubes extending between said tube sheets through said shell;
- a plurality of baffles supporting said tubes within said shell, said baffles being individually adjustable in a predetermined position and inclination with respect to said central pipe, to ensure a helical flow pattern of the medium through said shell and around said tubes; and
- fastening means for connecting said baffles to said central pipe.

4,493,369

METHOD OF IMPROVED OIL RECOVERY BY SIMULTANEOUS INJECTION OF WATER WITH AN IN-SITU COMBUSTION PROCESS

Aziz S. Odeh, Dallas, and Billy J. Dotson, Grand Prairie, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

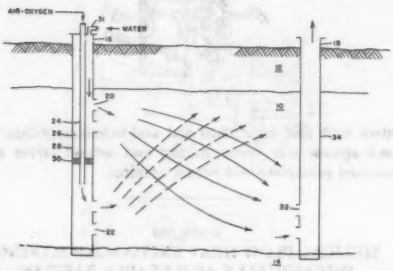
Continuation of Ser. No. 259,330, Apr. 30, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,596
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **8 Claims**

1. A method for recovering heavy oil from a subterranean,

permeable, heavy oil-bearing reservoir penetrated by an injection well and a production well, comprising:

(a) establishing a burning zone in the lower portion of said reservoir at the face of said injection well;

(b) injecting an oxygen-containing gas into the lower portion of said reservoir via said injection well to move said burning zone toward said producing well and to generate hot combustion gases;



(c) injecting a sufficient amount of water via an injection well into the upper portion of said reservoir to impede the flow of said hot combustion gases through the upper portion of the reservoir, to scavenge heat from the burned out portion of the formation, and to displace the oil through said reservoir towards the lower end of said production well; and

(d) recovering fluids including oil solely from the lower portion of said reservoir via said production well.

4,493,370

UREA AS A COSURFACTANT IN ENHANCED OIL RECOVERY PROCESSES

Paul R. Stapp, and Mary B. Chaney, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1983, Ser. No. 461,320
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **13 Claims**

1. A surfactant composition consisting essentially of:

(a) water;

(b) sodium chloride;

(c) a petroleum sulfonate surfactant having an equivalent weight of from about 225 to about 600; and

(d) urea;

wherein said water is present in an amount of 100 parts by weight; said sodium chloride is present in an amount from 0.1–10 parts by weight, said petroleum sulfonate surfactant is present in an amount from 0.1–15 parts by weight, and said urea is present in an amount from 0.05–15 parts by weight.

9. A process for hydrocarbon recovery from a subterranean formation comprising:

(a) injecting a surfactant system consisting essentially of water, sodium chloride, a petroleum sulfonate surfactant having an equivalent weight from about 225 to about 600, and urea, into said formation via at least one injection well;

(b) thereby causing the so-injected surfactant system to move from the injection well toward the producing well thereby displacing the hydrocarbon present in the formation; and

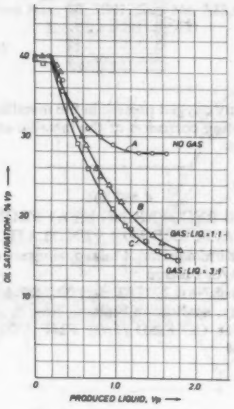
wherein said sodium chloride is present in an amount from 0.1–10 parts by weight, said petroleum sulfonate surfactant is present in an amount of from about 0.1 to about 15 parts by weight and said urea is present in an amount from about 0.05–15 parts by weight.

4,493,371

RECOVERING OIL BY INJECTING AQUEOUS ALKALI, COSURFACTANT AND GAS

Joseph Reisberg, Houston; Lawrence J. Bielamowicz, Bellaire, and David R. Thigpen, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 29, 1983, Ser. No. 518,711
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 **6 Claims**



1. An oil recovery process comprising:

injecting an oil-displacing fluid inclusive of gas and aqueous alkaline liquid into a subterranean reservoir containing an oil which is significantly acidic but forms monovalent cation soaps of only relatively low interfacial activity when reacted with an aqueous liquid containing a stoichiometric excess of dissolved alkaline material;

using as said oil-displacing fluid a mixture which, before or soon after entering the reservoir, is substantially homogeneous and contains significant proportions of (a) an aqueous alkaline solution containing kinds and amounts of dissolved inorganic alkaline material, polyalkoxyalcohol sulfate cosurfactant, and substantially neutral salt providing an alkalinity exceeding the stoichiometric requirement for neutralizing substantially all of the acidity of the reservoir oil and a total salinity which is substantially optimum for lowering the interfacial tension between the surfactant system which is formed by reaction with the reservoir oil at the reservoir temperature and (b) a fluid which is gaseous at the temperature and pressure encountered in the reservoir; and

recovering oil displaced by the injected fluid.

4,493,372

WELL COMPLETION SYSTEM AND PROCESS

Fred J. Radd; James B. Scott, both of Ponca City, Okla., and Robert B. Pan, Calgary, Canada, assignors to Conoco Inc., Ponca City, Okla.

Filed May 11, 1983, Ser. No. 493,468
Int. Cl.³ E21B *33/14*
U.S. Cl. 166—285 **2 Claims**

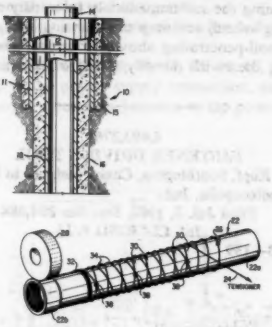
1. In a well extending to a subterranean location in the earth's crust, the combination comprising:

(a) a string of casing located in said well;

(b) a wrapping of metal wire about the outer surface of said casing in a conformation providing a plurality of helical turns which criss-cross one another; and

(c) a cement sheath in the annulus about said casing and encompassing said metal wire whereby said cement is bonded to said casing;

the combination further comprising a plurality of protrusion elements on said wire extending into said cement sheath,



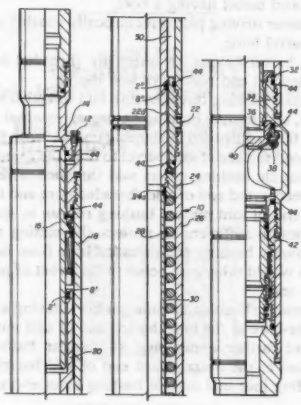
wherein said protrusion elements have a plurality of prongs in an angular configuration.

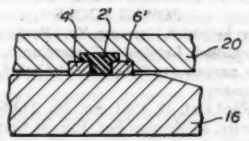
4,493,373

DYNAMIC SEAL FOR WELL TOOLS

Gerald D. Jackson, Broken Arrow, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Aug. 15, 1983, Ser. No. 522,986
Int. Cl.[3] E21B *34/10*; F16J *15/16*
U.S. Cl. 166—321 10 Claims





1. Sealing apparatus for establishing dynamic sealing integrity between two axially reciprocal concentric tubular members in a tool, comprising:

unitary elastomeric seal means encircling the inner and the two concentric tubular members for establishing dynamic sealing integrity therebetween during relative movement, the seal means having a T-shaped cross-section with base and tip sections, the base section being wider than the tip section;

a seal receptacle on one of the two concentric tubular members for receipt of the seal means, comprising a central annular groove dimensioned for receipt of the seal base and recessed ledges on each side of the central groove, the depth of the central groove being greater than the depth of the recessed ledges; and

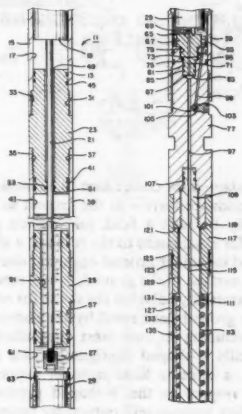
cylindrical means on opposite sides of the seal tip section, each overlapping at least a portion of the seal base section, the cylindrical means being supported by the recessed ledges, the cylindrical means extending beyond the periphery of the seal receptacle to reduce the radial gap between the two concentric tubular members above and below the sealing means for backing up the elastomeric seal means to decrease the axial extrusion of the T-shaped seal means due to temperature and pressure acting thereon; the cylindrical means contacting the other of the concentric tubular members to center the inner tubular member relative to the outer tubular member, uneven radial loads being applied to the cylindrical members rather than the elastomeric seal means whereby a uniform circumferential squeeze is maintained on the elastomeric seal means.

4,493,374

HYDRAULIC SETTING TOOL

Robert L. Magee, Jr., Fort Worth, Tex., assignor to Arlington Automatics, Inc., Grand Prairie, Tex.

Filed Mar. 24, 1983, Ser. No. 478,360
Int. Cl.[3] E21B *23/06, 33/129*
U.S. Cl. 166—382 10 Claims



1. A setting tool of the type used to set downhole devices in a well bore, comprising:

an elongated tubular body, said body having an outer sleeve portion and an inner piston portion slidably received within said sleeve portion, said inner piston portion and said outer sleeve portion being engagable with said device to be set whereby opposite relative movement of said piston portion and said sleeve portion acts to set said device; and

hydraulic pump means carried within said tubular body communicating with said inner piston portion by fluid passage means within said tubular body and isolated from said well annulus for supplying pressurized hydraulic fluid to said inner piston portion of said setting tool to move said inner piston portion relative to said outer sleeve portion and thereby set said downhole device.

9. A method of setting a downhole device in a well bore, comprising the steps of:

engaging said device to be set with a setting tool having an outer sleeve portion and an inner piston portion slidably received within said sleeve portion, said device being engagable with said setting tool whereby opposite relative movement of said inner piston portion and outer sleeve portion acts to set said device;

lowering said setting tool and device to be set on a wireline to the desired setting depth within said well bore; and

supplying gradual hydraulic fluid pressure from a hydraulic pump to said inner piston portion of said setting tool through fluid passage means located within said tubular body and isolated from said well annulus to move said inner piston portion relative to said outer sleeve portion of thereby set said downhole device.

4,493,375

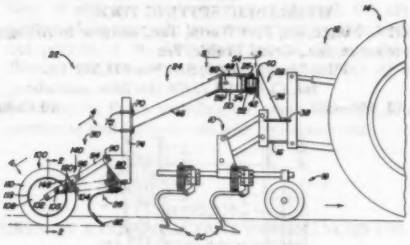
METHOD AND APPARATUS FOR FORMING AND REFORMING A FURROW

David C. Winter, Des Moines; Michael L. Pearson, and John D. Long, both of Ankeny, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 7, 1982, Ser. No. 414,994

Int. Cl.³ A01B *35/18, 69/00, 79/00*

U.S. Cl. 172—1 **13 Claims**



1. A device adapted for connection to an implement toolbar for forming a guidance furrow in the ground as the toolbar is towed forwardly through a field, said device comprising: a frame adapted for attachment to the toolbar; a shank attached to the frame and including ground-engaging shovel means for penetrating the surface of the ground; wheel means supported on the frame rearwardly adjacent the shank for rotation in, and forming of, the ground penetrated by the shovel means, said wheel means including an outermost circumferential portion having a generally V-shaped configuration for forming a V-shaped furrow, a circular band member supported radially inwardly with respect to the V-shaped portion, said band member extending transversely outwardly beyond the outermost circumferential portion and cooperative therewith to pack the edges of the furrow and to prevent loose soil from falling into the furrow, and means for averaging out abrupt transverse movements of the toolbar to prevent corresponding deviations in the formed furrow, said means for averaging including a bracket means for connection to the toolbar, vertical pivot means connecting the frame to the bracket means for permitting the frame to rock transversely with respect to, and to trail, the toolbar.

11. A method of forming a guidance furrow in the ground with respect to a transverse tool-carrying beam of a towed implement, said method including the steps of:

(a) towing the implement forwardly through the field;

(b) pivotally supporting a fore-and-aft extending wheel frame at its forward end from the beam in trailing relationship with respect to the implement;

(c) rotatably supporting a furrow-forming wheel from the aft end of the wheel frame in contact with the soil and permitting said wheel to trail with the wheel frame to average out abrupt movements of the beam in a direction transverse to the forward direction; and

(d) loosening the soil immediately forwardly of the furrow-forming wheel, said step of loosening including supporting a soil-penetrating shovel from the wheel frame for trailing therewith directly ahead of the furrow-forming wheel.

4,493,376

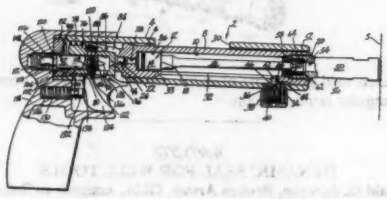
FASTENER DRIVING TOOL

Rowland J. Kopf, Southington, Conn., assignor to Uniset Corporation, Indianapolis, Ind.

Filed Jul. 2, 1982, Ser. No. 394,684

Int. Cl.³ B25D *9/11*

U.S. Cl. 173—139 **1 Claim**



1. A powder-actuated fastener driving tool comprising:

(a) a housing having a bore;

(b) a barrel reciprocally slidably mounted in said housing bore, said barrel having a bore;

(c) a fastener driving piston reciprocally slidably mounted in said barrel bore;

(d) said barrel having an internally threaded bore at the muzzleward end portion of said barrel;

(e) a muzzle bushing threaded into said threaded bore of said barrel, said muzzle bushing having an external circumferential flange disposed in abutting contact with the muzzleward end surface of said barrel to limit the extent to which said muzzle bushing enters said threaded bore, whereby the breechward end of said threaded bore and the breechward end of said muzzle bushing remain in spaced apart relationship sufficient to protect the mating threads on said muzzle bushing and threaded bore from deformation which would otherwise occur in the event of piston overdrive; and

(f) said muzzle bushing including a bore having an enlarged counter-bore at the breechward end of said muzzle bushing and further comprising an annular buffer member mounted in the muzzleward end of said barrel bore and extending into said muzzle bushing counter-bore.

4,493,377

ELECTRONIC TWO-HAND SAFETY SYSTEM FOR POWER TOOLS

Klaus Günther; Friedrich Hornung; Kurt Paule, all of Stuttgart, and Fritz Schädlich, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,648

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043264

Int. Cl.³ F16P *3/20*

U.S. Cl. 173—170 **26 Claims**

1. Operator safety system for power tools having

a power supply connection (1, 2);

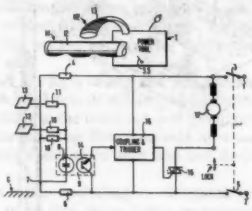
a motor (17);

a controlled switch (16) coupled to the motor for selective connection of the motor to the power supply connection; and an operator touch-controlled switch including

at least one electrically responsive sensing surface (12, 13, 29, 53, 54, 74) requiring surface engagement of at least a portion thereof by a hand of the operator for activation thereof to enable the tool to operate,

and an energization and control circuit for said touch-controlled switch comprising

a voltge divider (4, 6; 22, 25; 40, 41, 43, 44; 65, 72, 66, 68) connected to the power supply connection, said voltage divider having a common junction or tap point (7, 23, 45, 67, 80);



a coupling circuit (10, 11; 28; 54, 58; 75) coupling the at least one sensing surface to the common junction;

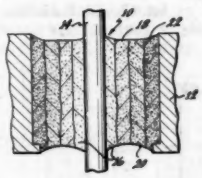
and an electrical recognition network (8, 18, 9; 27, 47, 48; 69, 73) coupled to the common junction and connected to and controlling the controlled switch (16) to ON condition and thus permit energization of the motor only if the at least one sensing surface is engaged by a hand of the operator.

4,493,378

TERMINAL ASSEMBLY

James C. Kyle, 24372 Via San Clemente, Mission Viejo, Calif. 92692

Filed Jul. 16, 1981, Ser. No. 284,129
Int. Cl.³ H01B 17/26; C03C 27/02
U.S. Cl. 174—152 GM 50 Claims



1. In combination,

a first electrically conductive member having a relatively high coefficient of thermal expansion,

a second electrically conductive member spaced from the first electrically conductive member and having a relatively low coefficient of thermal expansion, and

at least first and second layers of electrically insulating material respectively disposed between the first and second members in hermetically sealed relationship to each other and to the first and second members, the first layer of insulating material having a lower coefficient of thermal expansion than that of the first member,

the second layer of insulating material having a coefficient of thermal expansion less than that of the first layer of insulating material and greater than that of the second member,

the first and second layers of insulating material being partially amorphous and partially polycrystalline.

4,493,379

CABLE REAMING APPARATUS AND METHOD

James M. Reichman, Issaquah; Thomas A. O'Hanlon, Tacoma, both of Wash., and Thomas J. Kendrew, Redwood City, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 196,847, Oct. 14, 1980, Pat. No. 4,385,667.
This application Feb. 25, 1983, Ser. No. 469,951
Int. Cl.³ E21B 7/00
U.S. Cl. 175—57 6 Claims

1. A method of replacing an existing underground cable comprising the steps of reaming through the soild around and along the length of said cable from one end of the latter to its other end; attaching one end of a replacement cable to one end of said existing cable; and after attaching said cables and reaming through said soil, pulling said existing cable out of the ground from its otherwise free end, thereby causing the attached replacement cable to move into the space previously occupied by the removed cable.

4,493,380

HYDRAULIC STRAIGHT HOLE DRILL COLLAR

Jimmy D. Townson, Odessa, Tex., assignor to Kenneth A. Freeman, Midland, Tex.

Filed Sep. 29, 1982, Ser. No. 427,137
Int. Cl.³ E21B 7/06
U.S. Cl. 175—61 18 Claims

1. In a rotary drill string having a bit connected at the lower end thereof by a drill string hook-up, said hook-up comprises a plurality of drill collars connected in the string at a location above the bit; each of said collars having an axial passageway formed therethrough, a pin at one terminal end and a box at the other terminal end of each collar by which the collars are connected together to form said hook-up, the improvement comprising:

said hook-up includes at least one upper collar having a longitudinally extending, outwardly opening slot formed along the sidewall thereof, said slot has a back wall spaced from the collar axial passageway, and opposed confronting sidewalls; there being an upper end of said slot which

terminates in spaced relationship respective to said box end, and a lower end of said slot which terminates in spaced relationship respective to said pin end;

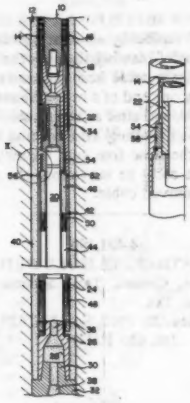
said hook-up further includes at least one lower collar having a continuous outer surface area uninterrupted by slots; so that said upper collar is placed at the point of tangency as the bit drills a crooked hole.

4,493,381

TURBODRILL WITH A REDUCED DRILLING FLUID PRESSURE ON A FLOATING PISTON

Masauemon Kajikawa, and Akio Ota, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 485,624
Int. Cl.³ E21B 4/02
U.S. Cl. 175—107 **3 Claims**



1. A turbodrill having rotary shaft means supported within a tubular housing and having a lower end extending therefrom for carrying a drill bit, a turbine within the housing for imparting rotation to the drill bit via the shaft means by being actuated by the flow of drilling fluid therethrough, a bearing rotatably supporting the shaft means adjacent said lower end thereof, seal means positioned below said bearing between said shaft means and said housing, and a floating piston positioned between the shaft means and the housing and defining an upper end of a lubricant chamber for containing a lubricant for lubricating the bearing, the floating piston also defining a lower end of a drilling fluid chamber above and opposed to the lubricant chamber for receiving part of the drilling fluid from the turbine, second seal means positioned between the shaft means and the housing above said drilling fluid chamber for restricting the inflow of the drilling fluid from the turbine to the drilling fluid chamber; and means defining a passageway through the housing for communicating the drilling fluid chamber with the outside of the housing; whereby the pressure of the drilling fluid in the drilling fluid chamber acting on the floating piston is made approximately equal to the pressure of the drilling fluid outside the housing.

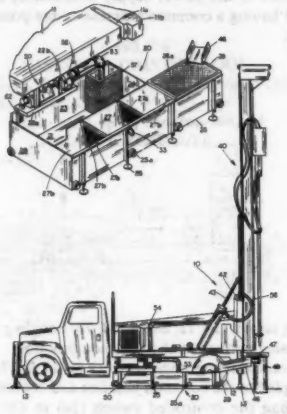
4,493,382

VEHICLE-MOUNTED EARTH DRILLING APPARATUS

Robert A. Collins, LeMars, Iowa, and Timothy A. Lewis, Aurora, Ill., assignors to Gus Pech Manufacturing Co., LeMars, Iowa

Filed Aug. 25, 1983, Ser. No. 526,378
Int. Cl.³ E21B 7/02
U.S. Cl. 175—206 **17 Claims**

1. A vehicle-mounted earth drilling apparatus of the type having an elongated mast mounted on said vehicle for pivotal movement from a horizontal storage position to a vertical operating position and means for circulating a liquid from a mud pit, into a hollow drill stem which is supported by the mast, into the hole being drilled, and back to the mud pit, the improvement comprising means for conforming the mud pit into a substantially flat-bottomed container having substantially vertical walls which comprise a closed polygon; substantially horizontal hinge means connecting the upper edge of one wall of the mud pit to a portion of the vehicle frame which is above the ground a distance approximately equal to the height of the connected wall of the mud pit; and means for conveying the liquid from the hole being drilled to the mud pit.

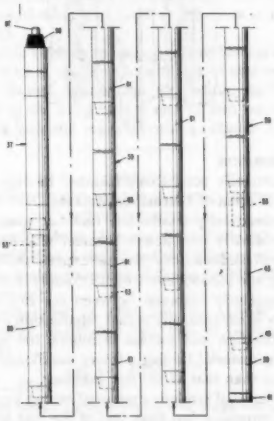


4,493,383

WELL CLEAN OUT TOOL

Robert M. Williams, and Bob Davis, both of Hobbs, N. Mex., assignors to Bull Dog Tool Inc., Hobbs, N. Mex.

Filed Jun. 7, 1983, Ser. No. 501,917
Int. Cl.³ E21B 37/00
U.S. Cl. 175—234 **9 Claims**



1. A well clean out tool comprising:

an elongated body having first and second ends and being adapted to be received within a well borehole, said elon-

gated body being comprised of a plurality of subs secured together;

a first sub at a lower portion of the body near the first end, the first sub having an inlet for receiving fluid and debris from the borehole, the first sub further including first flap valve means pivotally mounted within the first sub between a horizontal closed position and a vertical open position for permitting flow toward the second end and for preventing fluid flow toward the first end, said first flap valve being biased toward the closed position;

a second sub arranged above said first sub for receiving and retaining fluid and debris passing through said first sub;

a third sub arranged above said second sub, said third sub having second flap valve means for permitting flow toward the second end and for preventing flow toward the first end;

a fourth sub having a casing and being arranged above said third sub, said fourth sub including outlet means for returning fluid to the borehole, and pump means within said casing for drawing fluid into said inlet and through said first, second and third subs and out through said outlet means;

said pump means including an elongated piston having an internal bore, said piston being reciprocatingly driven in relation to said casing of the fourth sub;

third valve means at an end of the piston facing the third sub for permitting relatively free flow into the internal bore of said piston and preventing flow from said bore out through said end of the piston; and

the outlet means comprising a plurality of unrestricted openings through a longitudinal piston wall above said third valve means and closely adjacent said end of piston, an annular space between an outer surface of the piston and the casing, said outlet means further comprising unrestricted openings in the casing of the fourth sub near an upper end of the fourth sub, said openings being arranged to minimize a length of the fluid outflow path from the internal bore to the outside of the casing.

4,493,384

ELECTRONIC COUNTING SCALE

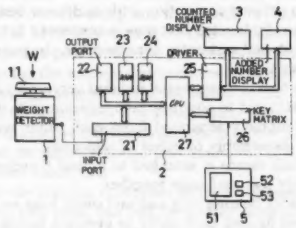
Shozo Yano, Kyoto; Akira Komoto, Shiga, and Yasuhiro Fujinaga, Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 28, 1983, Ser. No. 479,338

Claims priority, application Japan, Mar. 31, 1982, 57-54239; Mar. 31, 1982, 57-54240; Mar. 31, 1982, 57-54243

Int. Cl.³ G01G *19/00, 19/22*

U.S. Cl. 177—25 **10 Claims**



1. An electronic counting scale comprising a weighing tray to be loaded with items whose number is to be counted, a weight measuring means for measuring a gravitational force acting on said items loaded on said tray and for outputting a digital weight value corresponding to said gravitational force, a central processing unit which includes an arithmetic organ for processing said digital weight value according to a predetermined program, a memory for storing various calculating formulae, various calculated values and said predetermined program, said various calculating formulae containing a maximum number calculating formula which gives, in consideration of the weight fluctuations of the items to be counted, a maximum addable number rounded to the nearest whole number for fractions equal to or over 0.5 without giving a counting error, a number displaying means for displaying the number of said items calculated by said arithmetic organ, and an informing means for informing whether an unknown number of items added to an already counted known number of items is equal to or exceeds said maximum addable number calculated according to said maximum addable number calculating formula.

4,493,385

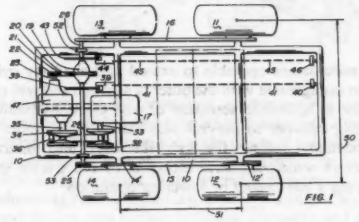
ALL TERRAIN VEHICLE

Samuel Shiber, P.O. Box 371, Mundelein, Ill. 60060

Filed May 25, 1983, Ser. No. 497,884

Int. Cl.³ B62D *11/08*

U.S. Cl. 180—6.2 **2 Claims**



1. An all terrain vehicle comprising in combination:

a frame,

four driven, non-steerable wheels, rotatably mounted on said frame, said wheels constituting a pair of front wheels and a pair of rear wheels, said wheels also constituting a pair of left wheels and a pair of right wheels, said right wheels being interconnected to rotate together and said left wheels being interconnected to rotate together,

an engine, mounted on said frame,

a torque responsive continuously variable transmission adapted to accept power from said engine,

a differential having an input for accepting power from said transmission and two outputs, a right output connected to said right pair of wheels and a left output connected to said left pair of wheels,

a split brake system allowing to selectively brake said right wheels or said left wheels,

a distance between said left pair of wheels to said right pair of wheels being larger than a distance between said front pair of wheels to said rear pair of wheels.

4,493,386

SINGLE CYLINDER TILT-CAB ANTI-TORSION APPARATUS

Lambertus J. Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Mar. 7, 1983, Ser. No. 472,494

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—89.15 **7 Claims**

1. In a single cylinder tilt-cab tractor comprising

(a) a chassis;

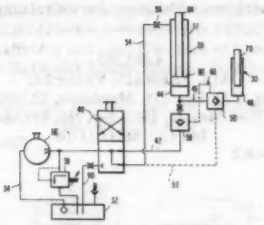
(b) a cab mounted on said chassis and pivotable with respect to said chassis about an axis near a front end of said chassis;

(c) a suspension assembly mounted between said chassis and cab at each of a left- and right-forward corner of said cab; and

(d) a single hydraulic cab tilting cylinder pivotably mounted between said chassis and said cab on one of the right side

or the left side of the cab and being operable to selectively tilt said cab between a normal running position and a raised service position, wherein the improvement comprises:

an auxiliary cylinder mounted upon one of said cab and said chassis and extending toward the other of said cab and said chassis opposite from the location of said single hydraulic cab tilting cylinder; and



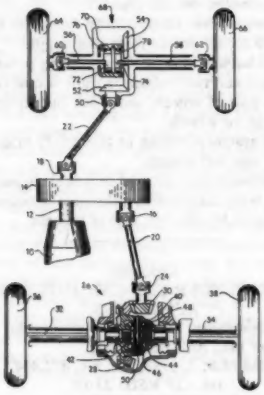
hydraulic means operable to extend said auxiliary cylinder into engagement with the other of said cab and said chassis prior to hydraulic actuation of said single hydraulic cab tilting cylinder to prevent said cab tilting cylinder from torsionally rolling the cab sideways into interfering contact with peripheral elements of the tractor engine during a cab raising or lowering operation.

4,493,387

CLUTCH DRIVEN FRONT AXLE FOURWHEEL DRIVE SYSTEM

W. H. R. Lake, Lathrup Village, and D. H. Grandinett, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 12, 1982, Ser. No. 407,534
Int. Cl.³ F16D *41/02*
U.S. Cl. 180—248 **6 Claims**



1. A system for driving the front and rear wheels of a vehicle from a transmission output shaft comprising:

front and rear driveshafts drivably connected to the transmission output shaft;

left and right rear axle shafts on which left and right rear wheels are carried;

a rear differential drivably connected to the rear driveshaft and to the rear axle shafts adapted to transmit motion therebetween such that the rear axle shafts turn at the same speed or at different speeds;

left and right front axle shafts on which left and right front wheels are carried;

overrunning clutches each having a driving member drivably connected to each of the front axle shafts adapted to transmit motion in the forward or reverse direction under driving torque from the driving member thereof to the front axle shafts and to allow free-running of the axle shafts in the forward or reverse direction relative to said driving member when driving torque is not applied; and

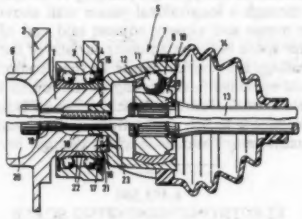
means drivably connecting the driving member of the clutches to the front driveshaft whereby the speed of the front axle shafts is less than the speed of the rear axle shafts.

4,493,388

BEARING ASSEMBLY FOR A VEHICLE WHEEL DRIVEN BY A ROTARY CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,863
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116775
Int. Cl.³ B60K *17/24*
U.S. Cl. 180—258 **5 Claims**



1. In an assembly for the hub of a wheel of a motor vehicle including wheel bearing means having an inner and an outer wheel bearing ring, said inner bearing ring being in driving connection with said wheel hub, universal joint means for driving said wheel hub through said inner bearing ring,

said universal joint means including an inner joint member and an outer joint member, with said outer joint member being in driving connection with said inner bearing ring, and centrally located bolt means connected between said wheel hub and said outer joint member, the improvement comprising:

that said wheel bearing means and said universal joint means are constructed to comprise two separate units which can be operationally separated from each other without requiring disassembly of either of said units;

that said bolt means is arranged to extend therebetween to adjustably join said units together;

that said inner bearing ring and said outer joint member are supported against each other in opposed facing relationship;

that positive locking means are provided between said inner bearing ring and said outer joint member in order to connect them together in torque-transmitting relationship to effect a driving engagement between said universal joint means and said wheel hub;

that said positive locking means comprise projections formed in one of said inner bearing ring and said outer joint member and recesses formed in the other for receiving said projections;

that said positive locking means are structured to engage said inner bearing ring and said outer joint member with-

out circumferential play therebetween while allowing axial play therebetween; and

that said bolt means is in threaded engagement between said wheel hub and said outer joint member to enable adjustment of said axial play.

4,493,389

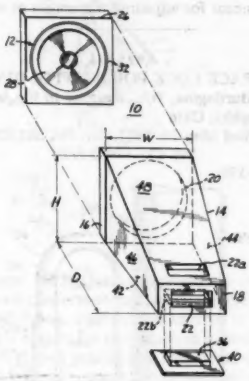
SPEAKER ASSEMBLY

Luis Del Rosario, 1363 N. Verdugo Rd., Glendale, Calif. 91208

Filed May 27, 1982, Ser. No. 382,429

Int. Cl.³ H05K 5/00

U.S. Cl. 181—152 26 Claims



1. A loudspeaker assembly comprising:

a loudspeaker; and,

an enclosed housing having an area defining a loudspeaker port and an area defining at least one sound port, the loudspeaker port being adapted to mount the loudspeaker substantially outside of the housing in a sealed relationship to the front of the housing, the loudspeaker directing sound into the housing, and the sound port having a cross-sectional area less than the cross-sectional area of the loudspeaker port so that the pressure of the second energy emitted at the loudspeaker becomes increased when emitted through at least one of the sound ports;

wherein the sound port is in substantially sealed relationship to an at least partially enclosed space so that sound energy passed through the sound port enters the at least partially enclosed space; and

wherein the housing comprises an enclosed tapered housing having two ends, one end of greater cross-sectional area and the other end of lesser cross-sectional area, the end of greater cross-sectional area having an area defining the loudspeaker port and the end of lesser cross-sectional area having an area defining one of the at least one sound port; and

wherein the housing comprises four walls defining a rectangular cross section at the end of lesser cross-sectional area and a square cross section at the end of greater cross-sectional area, whereby the wall of greater cross-sectional area is adapted to receive a circular loudspeaker and said wall of lesser cross-sectional area is adapted to channel sound through an elongated opening.

4,493,390

APPARATUS FOR THE COMBINED PRODUCTION OF ELECTRICAL ENERGY AND HEAT

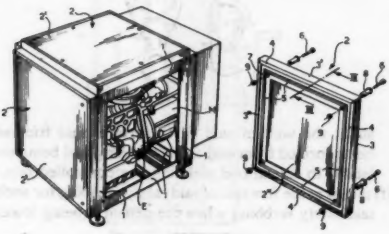
Roberto Pagano, Turin, and Alessandro Nannini, Bruino, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 10, 1983, Ser. No. 465,401

Claims priority, application Italy, Feb. 11, 1982, 52918/82[U]

Int. Cl.³ F01N 1/24

U.S. Cl. 181—204 7 Claims



1. Apparatus for the combined production for electrical energy and heat, including a supporting framework constituted by sectional elements arranged at the edges of a parallelepiped and supporting an internal combustion engine, an electrical generator device coupled to the engine, and means for recovering the energy transformed into heat in the engine and in the electrical device; and further including thermally and acoustically insulating panels removably fixed to the framework and covering the side faces and the upper face of the parallelepiped defined by said framework, wherein each said panel is provided with a continuous peripheral gasket of elastomeric material having an essentially L-shaped transverse section with a first portion which covers the peripheral surface of the panel and a second portion which covers a portion of the face of the panel which, in the assembled condition, faces the framework, and wherein the said second portion of the gasket is provided with projecting first and second curved lips adjacent and parallel to the periphery of the panel, each said lip being concavely curved towards the other lip, wherein spacer elements project from the said face of each panel facing the framework to maintain the panel at a predetermined distance from the framework when the panel is fixed to the framework, whereby the curved lips of the gasket fitted to the panel are resiliently deformed against the framework and, together with the framework and the second portion of the gasket, define a sealed air chamber.

4,493,391

SAFETY LOWERING DEVICE

Preston J. Van Patten, 15 Lynn Dr., Scotia, N.Y. 12302

Filed Jun. 1, 1982, Ser. No. 383,966

Int. Cl.³ A62B 1/16

U.S. Cl. 182—6 6 Claims

1. A self-contained safety device for self-lowering a person, comprising

(a) an elongated high-strength safety webbing of sufficient strength to safely support the person;

(b) a reel housing said webbing which is adapted to be released from said reel;

(c) a generally figure 8 shaped member having first and second adjacent aligned apertures in a common plane;

(d) a seat for secure engagement of said person, said seat comprising a non-slip buckle means and two elongated high-strength seat webbings each of said seat webbings being looped to form first a leg hole and one-half of waist hole, one-end of each seat webbing being secured by passing through said second aperture of said generally figure 8 shaped member, with a intermediate portion thereof, being folded back upon itself forming said leg hole and one-half of said waist hole, and the opposite end

of each seat webbing being connected through said non-slip buckle means;

(e) a friction knot formed by passing said safety webbing through said second aperture and then through said first aperture of said generally figure 8 shaped member and

about the wall of said first aperture, said friction knot being formed from said safety webbing and being manipulatable to extend said webbing at a controlled rate, and

(f) means at the free end of said safety webbing for anchoring said safety webbing when the person is being lowered.

4,493,392

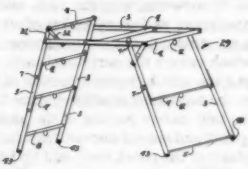
CONVERTIBLE FOLD-UP LADDER

Salvador Alimbau Marques, San Elias 21 3°, Barcelona 6, Spain

Continuation-in-part of Ser. No. 341,830, Jan. 22, 1982, Pat. No. 4,457,391, and a continuation-in-part of Ser. No. 417,382, Sep. 13, 1982, Pat. No. 4,429,766, and a continuation-in-part of Ser. No. 492,487, May 6, 1983, Pat. No. 4,448,283. This application Sep. 29, 1983, Ser. No. 537,276

Int. Cl.³ E06C *1/383*

U.S. Cl. 182—27 19 Claims



1. A convertible fold-up, lean to ladder comprising a plurality of U-shaped modules having means movably connecting each module to the next adjacent module, at least a portion of a locking means provided in said modules adapted to lock said modules together in a substantially rigid manner, said locking means comprising a latch, a latch release means and an aperture to mate with said latch, said latch located in a first module and said aperture located in the module immediately adjacent said first module, said latch having a rounded end portion and positioned in mating alignment with said aperture when said ladder is in its extended mode, the length of said modules having a curved outer surface to facilitate entrance of said latch into said aperture, the horizontal arms of said U-shaped modules defining the rungs of said ladder, at least a section of the wider modules overlapping at their upper vertical portions with the bottom portions of the next adjacent narrower modules, and said locking means and said module hinge means provided within said overlapping portions.

4,493,393

MECHANIC'S REST

Hector Serber, 40 Old Ranch Rd., Novato, Calif. 94947

Filed Sep. 6, 1983, Ser. No. 529,518

Int. Cl.³ A47C *16/00*

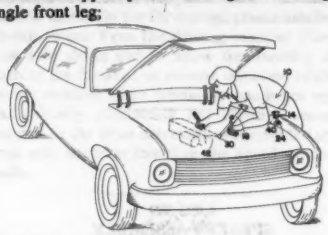
U.S. Cl. 182—129 9 Claims

1. A mechanic's rest comprising:

a chest support platform of a size to generally fit the frontal area of a typical human torso, gently concave and contoured on its upper surface to approximate the shape of such a torso with forward corners removed to facilitate arm movement;

cushioned lower support means attached to the underside of said chest support platform along the rear edge thereof;

a single front leg;



a ball and socket joint mounting said front leg to swivel to the underside of said chest support platform intermediate the sides thereof; and

extensible means for adjusting the length of said front leg.

4,493,394

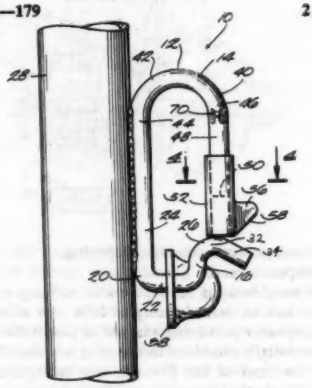
BRACE LOCK FOR SCAFFOLDING

Stig Karlsen, Burlington, Wis., assignor to Figgie International Inc., Willoughby, Ohio

Filed May 24, 1982, Ser. No. 381,021

Int. Cl.³ E04G *7/22*

U.S. Cl. 182—179 2 Claims



1. A locking device for a scaffold brace comprising:

a generally C-shaped member **10** having a vertical leg **24** for attachment to a scaffold member, a lower U-shaped support portion having two upwardly extending vertical legs for supporting the scaffold brace thereon with the end of one support leg connected to the lower end of said vertical leg, a scaffold brace receiving end **34** extending horizontally and downward from the end of the other leg of said U-shaped support portion to facilitate the mounting of the scaffold brace onto said locking device, and an upper leg **12** connected to the upper end of said vertical leg and having a vertically depending latch retaining portion **48** on the end thereof positioned directly above said brace receiving end; and

a latch member **52** slidably mounted on said latch retaining portion and movable between a scaffold brace blocking position and a scaffold brace nonblocking position, said latch member having a tab member thereon to facilitate manual actuation thereof, said tab member having a cam surface thereon which cooperates with a scaffold brace when the brace is inserted onto said scaffold brace receiv-

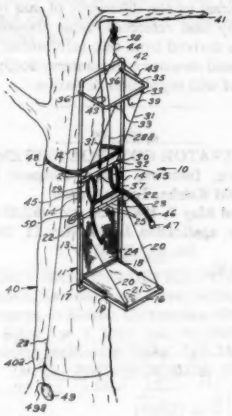
ing end to thereby facilitate mounting the brace onto the locking device.

4,493,395

TREE STAND FOR HUNTERS

Raymond G. Rittenhouse, 1392 SR 41 SW., Washington Court House, Ohio 43160

Filed Oct. 3, 1983, Ser. No. 538,536
Int. Cl.³ A01M *31/02*; A45F *3/26*; A47C *9/10*
U.S. Cl. 182—187 **1 Claim**



1. A tree stand for hunters, comprising, in combination, a frame, a plywood platform secured to said frame, a canvas seat attached to said frame, a safety belt secured to said frame, a block and tackle suspension unit attached to said frame, a tree securement belt looped around said frame, and a bow support device and a long gun support device secured to said frame; said frame including a pair of "U"-shaped, tubular members pivotally attached together by hinges and forming an upper and a lower portion, said platform being pivotally secured within said lower portion of said frame by pivot pin means, said seat being foldable above said platform and being secured, at one end, to a pivotable bar secured to said platform, and an opposite end of said seat is fixedly secured to a cross bar welded to said lower portion of the frame; and said suspension unit is attached to said upper portion of the frame and includes weight means for attaching said tree stand around a tree limb.

4,493,396

WINCH FOR SAFELY LOWERING A PERSON AT A CONTROLLED RATE

Joseph Borgia, V, 2723 Riverview Dr., Naples, Fla. 33942

Filed Mar. 14, 1983, Ser. No. 475,253
Int. Cl.³ A62B *1/12*
U.S. Cl. 182—238 **3 Claims**

1. A self-contained compact winch for use in safely lowering a person from an elevated position comprising:

a drum-shaped cylindrical casing;

a rotatable shaft within the casing mounted on a pair of bearings located on opposite sides of the drum-shaped casing;

a spool axially affixed to the shaft;

a cam plate axially affixed to the shaft;

a brake disc axially affixed to the shaft;

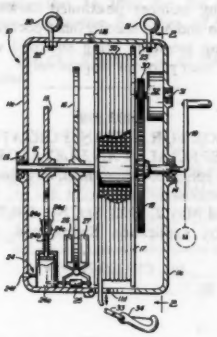
a first gear axially affixed to the shaft;

an air pump mounted on the inside of the casing and having a piston rod actuated by the rotation of the cam plate;

a disc brake assembly within said casing activated by the air pump engage said brake disc;

a length of cable wound upon the spool with the free end of said cable depending from a hole in said casing;

a centrifugally operated clutch mechanism mounted on the inside of the casing and including a second gear meshing with the first gear; and



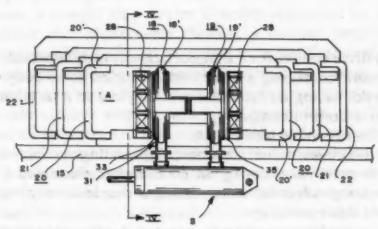
means including a crank attached exteriorly of the casing to one end of the shaft for rewinding the cable onto the spool.

4,493,397

FORK LIFT TRUCKS

George L. Maes, Collierville, Tenn., assignor to Nissan Industrial Equipment Co., Memphis, Tenn.

Filed Aug. 6, 1982, Ser. No. 405,895
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 E **3 Claims**



1. A tensioning device for maintaining proper tension on a section of the hydraulic lines of a fork lift truck having a truck assembly; having a telescopic mast assembly, including a first mast member, a second mast member to which said first mast member is slidably attached, and a third mast member to which said second mast member is slidably attached and which is attached to said truck assembly; and having a piston including a first end for being operatively attached to said first mast member and including a second end for being operatively attached to said second mast member, said tensioning device comprising:

(a) sheave means for guidingly receiving said section of said hydraulic lines; and

(b) mounting means for mounting said sheave means to said first end of said piston of said telescopic mast assembly in such a manner that said section of said hydraulic lines is substantially maintained within the confines of said telescopic mast assembly regardless of the position of the mast assembly; said mounting means including a body member attached to said telescopic mast assembly, said body member including a first upwardly directed body portion and a second upwardly directed body portion; said mounting

means including a head member, said head member including a first head portion slidably mounted on said first body portion and including a second head portion slidably mounted on said second body portion; said mounting means including a first spring member positioned between said first body portion and said first head portion, and a second spring member positioned between said second body portion and said second head portion, said first and second spring members being enclosed within said first and second head portions respectively.

4,493,398

DRIVE CONTROL FOR A TRANSPORTATION SYSTEM, ESPECIALLY AN ELEVATOR

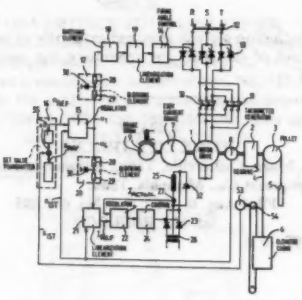
Gerhard Kindler, Meggen, Switzerland, assignor to Iventio AG, Hergiswil, Switzerland

Filed May 2, 1983, Ser. No. 490,779

Claims priority, application Switzerland, May 3, 1982, 2688/82

Int. Cl.³ B66B 1/24

U.S. Cl. 187—29 R **7 Claims**



1. A drive control for a transportation system, especially for an elevator containing a drive motor coupled to an eddy current brake having an excitation winding and to a tachometer, said drive control comprising:

a reference value transmitter;

said reference value transmitter generating an increasing reference value during an acceleration phase and a decreasing reference value during a deceleration phase of said drive control;

a first regulator operatively connected with said reference value transmitter and having an input and an output;

said input being connected to said tachometer which supplies an actual value of the rotational speed of said drive motor to said first regulator;

a first control member for controlling a driving torque of said drive motor;

a first control circuit formed by said first regulator and said first control member;

a second control member for controlling a braking torque of said eddy current brake;

a second control circuit formed by said first regulator and said second control member;

said output of said first regulator being connected to said first control member and to said second control member;

a first blocking element for blocking the regulation of said drive motor;

a matching element for approximately matching the variation in said driving torque and in the rotational speed of the drive motor during said acceleration phase to the variation of said driving torque and said rotational speed of the drive motor during said deceleration phase;

a first linearization member;

said first blocking element, said matching element and said first linearization member being operatively connected in said first control circuit;

a second blocking element for blocking regulation of said eddy current brake;

a second linearization member;

a second regulator including a feedback loop for feeding back the current detected in said excitation winding of said eddy current brake to said second regulator;

said second blocking element, said second linearization member and said second regulator being connected in said second control circuit;

said first regulator being supplied with a regulation deviation determined by the difference of said reference value generated by said reference value transmitter and said actual value derived from said tachometer; and

said travel of said elevator being automatically controlled as a function of said regulation deviation.

4,493,399

ELEVATOR CONTROL SYSTEM

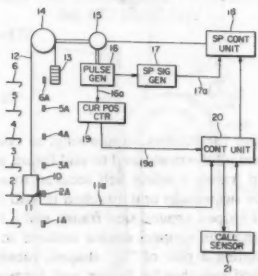
Ryuichi Kajiyama, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1983, Ser. No. 492,007

Claims priority, application Japan, May 11, 1982, 57-78605

Int. Cl.³ B66B 1/18

U.S. Cl. 187—29 R **4 Claims**



1. A control system for an elevator wherein the distance between the current elevator car position and the target position of a floor at which the car is to be halted is detected on the basis of a car position signal computed from car displacements and a preliminarily stored floor position signal for controlling the car speed, said system comprising:

means for sensing the floors of a building in which the car is mounted, said means issuing an output signal whenever the car has reached a floor;

means for detecting the current car position, said detecting means issuing an output representing the current position of the car; and

means for controlling the car speed on the basis of the outputs from said floor detecting means and said current position detecting means;

said control means including

(a) a read-only memory for storing floor data concerning respective floor positions of a building according to the building schedule;

(b) a read-write memory for storing floor data concerning respective floor positions to be used for the car speed control; and

processor means in said control means coupled to said memories (1) for transferring the floor data in said read-only memory to said read/write memory to be used for car speed control when the power is applied to said control means; (2) for causing the car to travel to a floor, the floor data of which is not corrected in said read.write memory, in such a manner that the car is caused to travel to a target

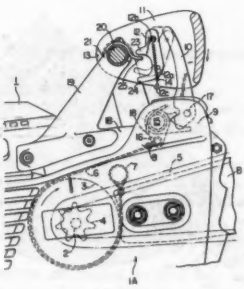
position a predetermined distance ahead of the floor position indicated by the floor data for said floor stored in said read/write memory; (3) for correcting the floor data concerning a target floor stored in said read/write memory by replacing said floor data with the prevailing car position output from said current position detecting means when the output from said floor detecting means has shown that the car has arrived at the target floor, and (4) for storing in said read/write memory the indication that the correction of the position data of said target floor is completed; the correction of the floor data in the read/write memory being not made by the processor means if the current car position data corresponds to the actual floor position data.

4,493,400

EMERGENCY BRAKING DEVICE FOR CHAIN SAW

Akira Nagashima, Kawasaki, and Yasuo Saito, Fujisawa, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,654
Claims priority, application Japan, Apr. 13, 1981, 56-54417
Int. Cl.³ F16D *49/04*; B23D *57/02*
U.S. Cl. 188—77 W **2 Claims**



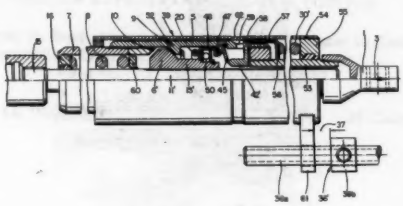
1. In a chain saw having a clutch drum (3) drivingly connected to a crank shaft (2) of an engine through a centrifugal clutch, and an emergency braking device, said braking device comprising: a braking band (6) wound around said clutch drum (3), said braking band (6) having one end fixed to the body of said chain saw; an actuating means (16) to which the other end of said braking band is fixed; an inertia member (11) disposed in the vicinity of a front handle (20) of said chain saw and surrounding a lever member (10) of said actuating means (16); a coil spring (18) for holding said braking band (6) and said lever member (10) at predetermined positions; a hit spring (14) overcoming the resistance of said coil spring (18) and causing the pivoting of said lever member (10) to tighten said braking band (6); a hit switch member (12) pivoted on said inertia member (11) adapted to hit said lever member (10); and a stopper plate (25) fixed to said front handle (20) for pushing said hit switch member (12); the pivoting of said hit switch member (12) being initiated by the inertia action of said inertia member (11) and being completed by the action of said hit spring (14) whereby said braking band (6) is tightened by the action of said lever member (10) to brake said clutch drum (3).

4,493,401

AUTOMATIC BRAKE RESETTING DEVICE

Nils B. L. Sander, Osby, Switzerland, and Julius Nadas, Eching, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 117,984, Feb. 4, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,375
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904028
Int. Cl.³ F16D *65/56, 65/66*
U.S. Cl. 188—199 **6 Claims**



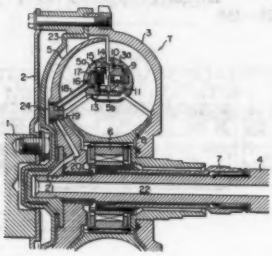
1. In an automatic brake resetting device particularly for railway vehicles, first and second rod members telescopingly displaceable with respect to each other and which transmit a braking force, a rotatable coupling element having a threaded shaft with a non-self locking thread thereon connected to one of said rod members, rotary coupling means between said rotatable coupling element and a non-rotatable portion of the other rod member and being actuated by axial displacement of said rotatable coupling element with respect to said non-rotatable rod member portion, a first spring acting upon said rotary coupling element in a direction to close said rotary coupling means, a control stop device slideably supported on a guide member and displaceable through a control distance, said guide member being so mounted as to be displaceable with respect to said rotatable coupling element a distance proportional to the brake stroke, a second spring operatively coupled to said control stop device, lever means for coupling said control stop device, said non-rotatable rod member portion and said rotatable coupling element to transmit force therebetween upon displacement of said rotatable coupling element in a direction to open said rotary coupling means, said lever means having such a transmission ratio to amplify force transmitted from said second spring to said rotatable coupling element, said lever means comprising a variable angle conical annular element coaxial to said rotatable coupling element, said annular element having inner and outer peripheral edge portions, the outer peripheral edge portion being operatively connected to the other rod member and the inner peripheral edge portion being operatively connected to said control stop device, and an annular portion of said annular element between said peripheral edge portions being operatively connected to said rotatable coupling element, said conical annular element having a longer lever arm between said inner peripheral edge and said coupling element connection, said conical annular element having a plurality of radial slots beginning at one peripheral edge and terminating short of the other peripheral edge, and an axial bearing on said rotatable coupling element and acted upon by said first spring, a coupling ring axially displaceable with respect to one of said rod members engaging said conical annular element and disposed on the side of said axial bearing away from said first spring, and an axially displaceable tubular element positioned radially outwardly of said axial bearing having on one end thereof a flange disposed between said first spring and said axial bearing and another end thereof connected to said coupling ring.

4,493,402

HYDRAULIC TORQUE CONVERTER FOR VEHICLES

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,347
Claims priority, application Japan, Jun. 5, 1981, 56-86607
Int. Cl.³ B60K 41/28
U.S. Cl. 192—326 6 Claims



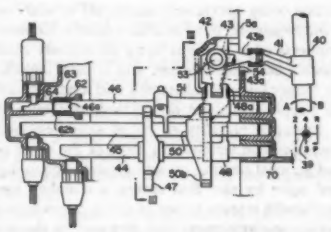
1. A hydraulic torque converter comprising:
(a) a pump wheel having an engine output shaft coupled thereto;
(b) a turbine wheel having a turbine output shaft connected thereto, wherein said turbine wheel is coupled to said pump wheel through a fluid coupling for the transmission of power therebetween;
(c) a one-way clutch means;
(d) an on-off clutch means connected in series with said one-way clutch means, said serially connected clutch means being disposed side-by-side in a space defined between opposed inner walls of said pump wheel and said turbine wheel for connection between said pump wheel and said turbine wheel; and
(e) means for operating said on-off clutch means, wherein when said on-off clutch means is engaged and said one-way clutch means is engaged, said turbine wheel is mechanically coupled to said pump wheel for the transmission of power thereto.

4,493,403

PARKING LOCK MECHANISM FOR A SHIFT LEVER

Toshio Takano, Hamuramachi, and Shinichiro Mura, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,435
Claims priority, application Japan, May 30, 1981, 56-82763
Int. Cl.³ B60K 41/26
U.S. Cl. 192—4 A 4 Claims



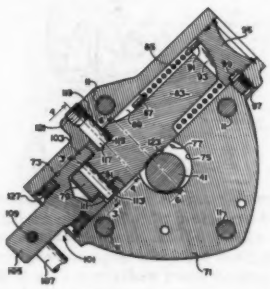
1. An improved parking lock mechanism for a vehicle having a clutch, a transmission including a transmission case, a shift lever, a link mechanism for transmitting the operation of said shift lever to shifter rails in said transmission for selecting change speed gears, and a parking position for said shift lever, the improvement comprising:
a shaft securely mounted on said transmission case;
a select lever rotatably and axially slidably mounted on said shaft;
interlocking means adapted to be slid together with said select lever;
first means for transmitting the operation of said shift lever to said select lever for rotating and sliding thereof;
a parking shifter rail provided for parking;
a fork secured to said parking shifter rail and operatively engaged with an end of said select lever so as to transmit the rotary movement of the select lever to the shifter rail;
a parking pawl operatively engaged with said parking shifter rail;
a parking gear secured to an output member of said transmission so as to be engaged with said parking pawl;
second means for converting the movement of said parking shifter rail to the movement of said parking pawl for engaging said pawl with said parking gear; and
third means provided in said interlocking means for locking said fork when said select lever is shifted to the parking position.

4,493,404

HYDRAULIC GEROTOR MOTOR AND PARKING BRAKE FOR USE THEREIN

Wayne B. Wenker, Hopkins, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 22, 1982, Ser. No. 443,512
Int. Cl.³ F16H 57/10; B60K 41/28
U.S. Cl. 192—4 A 14 Claims



1. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; an internal gear set associated with said housing means and including an internally-toothed member and an externally-toothed member eccentrically disposed within said internally-toothed member, one of said members having rotational movement about its axis, and one of said members having orbital movement about the axis of the other member, the teeth of said members interengaging to define expanding and contracting volume chambers during said movements; valve means operable in response to one of said movements to communicate fluid from said fluid inlet means to one of said expanding and contracting fluid chambers, and from the other of said fluid chambers to said fluid outlet means; shaft means operatively associated with one of said toothed members to have one of (a) pure rotational movement, and (b) both orbital and rotational movement, characterized by:
a lock member operably associated with said housing means and being disposed adjacent one of (a) said toothed member having said orbital movement, and (b) a portion of said shaft means engaging in orbital movement, said member and said portion defining imaginary orbit circles as at least

one of said member and said portion engage in said orbital movements, said lock member defining a lock surface and being movable between a first position in which said lock surface is disposed outside said orbit circles to permit normal orbital and rotational movement of said toothed members, and a second position in which said lock surface is disposed within at least one of said orbit circles to engage said one of (a) said toothed member and (b) said portion of said shaft means and prevent said orbital movement thereof, thereby preventing said rotational movement.

4,493,405

CLUTCH AND BRAKE WITH BEARING PROTECTION

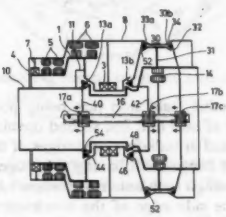
Martin Roth, Taufkirchen, and Bernhard Stahn, Irschenhausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,619

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107385

Int. Cl.³ F16D *67/02*

U.S. Cl. 192—18 R **11 Claims**



1. A clutch and brake bearing protection comprising:

a housing;

a first shaft rotatably mounted to the housing;

at least one bearing connected between said housing and said first shaft for rotatably mounting said first shaft to said housing;

a second shaft coaxially mounted and at least partially extending within said first shaft adapted to drive a load with rotation of said second shaft, said second shaft being radially and axially free of said first shaft;

drive means connected to said first shaft for rotating said first shaft;

shaft coupling means connected to said first and second shafts movable into a first position for engaging said first shaft to said second shaft against relative axial and radial motion and to a second position for disengaging said first shaft from said second shaft and for permitting relative axial and radial motion between said first and second shafts;

a friction brake connected between said second shaft and said housing and associated with said coupling means for movement into a first position with said coupling means in its second position for engaging said second shaft with said housing to transmit forces from said second shaft to said housing when said first and second shafts are disengaged from each other;

said coupling means comprising a threaded spindle rotatably mounted in said second shaft, a nut threaded to said threaded spindle and a coupling member connected to said nut for movement, with rotation of said spindle into simultaneous engagement with at least a portion of said first and second shafts to engage said first and second shafts to each other, said friction brake connected to said nut and operable by said threaded spindle simultaneously with the operation of said coupling means for disengaging said first and second shafts simultaneously with the engagement of said second shaft with said housing, said friction brake having a brake shoe connected to said nut and movable to simultaneously engage at least a portion of said housing with said second shaft simultaneously.

4,493,406

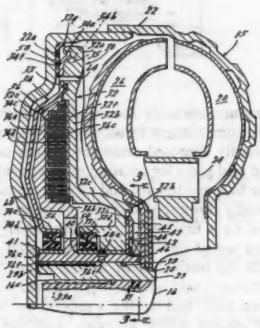
VISCOUS BYPASS COUPLING FOR TORQUE CONVERTER

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 31, 1983, Ser. No. 499,617

Int. Cl.³ F16D *31/00*

U.S. Cl. 192—58 B **16 Claims**



1. A viscous coupling of the type including a clutch assembly having an annular axially extending hub portion adapted for driving connection to a shaft, an annular, radially extending clutch portion extending radially outward of and joined to the hub portion by a bridge portion; an annular housing assembly having axially spaced, radially extending, annular side wall members defining a chamber containing the clutch portion and a viscous fluid for transmitting torque between the clutch hub portion and a radially outer peripheral portion of the housing assembly via spaced working means defined by mutually facing portions of the clutch portion and one of the side wall members; an annular axially, extending hub portion at the radially inner edge of the one side wall member journaled on the outer peripheral surface of the clutch hub portion; seal means cooperating between said annular housing assembly and said clutch hub portion; the improvement comprising:

thrust means reacting axial forces on said one side wall member for inhibiting changes in the axially spaced distance between said working means, said thrust means and said journal providing the sole support for radial and axial loads on said housing assembly and including:

a first thrust member extending radially outward from the inner edge of and contacting a radially extending surface of the member hub portion of said one side wall member for preventing axial movement of said hub portions relative to each other; and

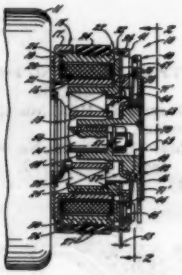
a second thrust member having a radially outer edge fixed to said one side wall member at a position radially outward of the radially outer edge of said first thrust member and extending radially inward to a position overlapping and sandwiching said first thrust member between said radially extending surfaces of said one side wall member and said second thrust member.

4,493,407

ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC CLUTCH

Paul P. Newton, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Dec. 14, 1981, Ser. No. 330,651
Int. Cl.³ F16D 3/12, 3/76, 27/10
U.S. Cl. 192—84 C 1 Claim



1. An armature assembly for an electromagnetic coupling, said assembly comprising a forwardly disposed mounting plate and a rearwardly disposed armature, means connecting said armature and said plate for rotation in unison while permitting said armature to move toward and away from said plate, a hole extending axially through said plate, the periphery of said hole being defined by a first set of circumferentially spaced teeth and by a first set of circumferentially spaced valleys which alternate with the teeth, a shaft having a hub formed on one end portion thereof, said hub having a second set of circumferentially spaced teeth and having a second set of circumferentially spaced valleys which alternate with the second teeth, said hub being telescoped into said hole with the teeth of each set being disposed within and spaced from the valleys of the other set, at least the teeth of one set and the valleys of the other set being flared outwardly in the forward direction, an annulus of elastomeric material disposed within said hole between said hub and the periphery of the hole and having alternating teeth and valleys interfitting with the teeth and valleys on the hub and in said hole, the cross section of said annulus being sized so that the annulus is pre-compressed between the hub and the hole at all points around the periphery of the annulus by forcing the hub inwardly, and means forcing and holding said hub inwardly to pre-compress said annulus and hold the entire annulus in a state of residual compressive stress when torque is applied and transmitted through the annulus between the mounting plate and the armature.

4,493,408

DAMPER DISC

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Sep. 21, 1981, Ser. No. 304,260
Int. Cl.³ F16D 3/14
U.S. Cl. 192—106.2 3 Claims

1. A damper disc comprising a hub splineable to an output shaft, said hub having an outer periphery;

a radial flange formed on the outer periphery of the hub;

a pair of annular side plates disposed at both sides of the flange;

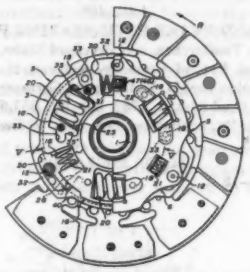
torsion springs disposed in alternating first and second openings formed in the flange and the side plates and registering in the axial direction of the disc, said side plates being connected to the flange by the springs, said first and second openings have side edges;

a pair of annular sub-plates disposed between the side plates and the flange;

stud pins connecting the sub-plates together;

recess formed at middle portions of the side edges of the first openings in the flange, each stud pin passing through said each recess with a space between the stud pin and the side edge of the recess corresponding to a torsion angle for first hysteresis torque, at least one said stud pins being positioned in one of said first openings adjacent the respective recess in a forward circumferential direction of travel when the disc is not undergoing torsion;

stop pins connecting the radially outer portions of the side



plates together, said stop pins being positioned radially outwardly of said first and second openings;

notches formed at radially outer edges of the second openings in the flange each having side edges, each stop pin passing through each notch with a space between the stop pin and the side edge of the notch corresponding to a maximum torsion angle;

first friction members arranged between the sub-plates and the flange, and having small frictional force; and

second friction members arranged between the sub-plates and the side plates, and having large frictional force.

4,493,409

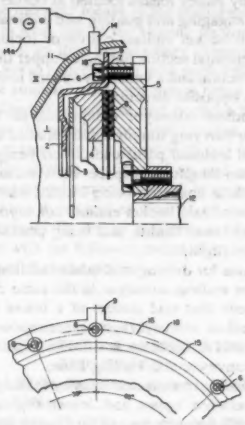
FRICTION CLUTCH

Klaus Steeg, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Büh, Fed. Rep. of Germany

Continuation of Ser. No. 116,945, Jan. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 847,805, Nov. 2, 1977, abandoned. This application Jan. 18, 1982, Ser. No. 340,390
Int. Cl.³ F16D 65/00
U.S. Cl. 192—115 11 Claims

1. In a power unit, particularly in an ignition-operated combustion power unit, the combination of a rotary crankshaft; a flywheel on said crankshaft, said flywheel having a friction surface; a friction clutch adjacent to said flywheel and including a cover provided with a single marker constituting an ignition point indicator, resilient means between said cover and said flywheel, a pressure plate interposed between said resilient means and said flywheel and having a friction surface facing the friction surface of said flywheel, and a clutch disc between said friction surfaces; and cooperating torque transmitting means provided on said cover and said flywheel for connecting said cover with said flywheel in a single predetermined angular position relative to each other so that said marker is invariably

maintained in one and the same predetermined angular position with reference to said crankshaft and said flywheel whenever



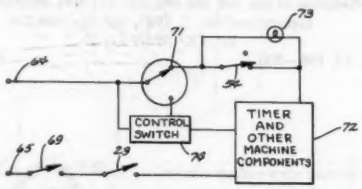
said torque transmitting means connects said cover and said flywheel to each other.

4,493,410

DOUBLE ACTUATION COIN SLIDE SYSTEM

Robert B. Nelson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1982, Ser. No. 453,875
Int. Cl.³ G07F 5/12
U.S. Cl. 194—1 G **8 Claims**



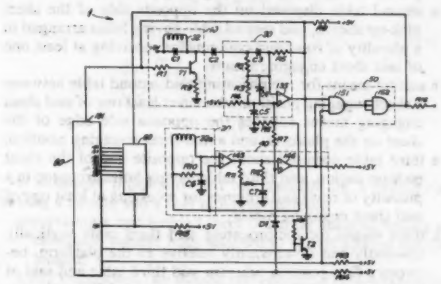
1. A double actuation coin slide system associated with a housing and operable for initiating an electrically energized vending operation, the combination comprising: a power source providing electrical power between a pair of electrical conductors for powering means for effecting said vending operation; first and second switch means associated with said electrical conductors, each of said first and second switch means being operable between power connecting first and power disconnecting second postures for cooperatively connecting or individually disconnecting electrical power from said power source to said vending effecting means with said first switch means being in said power disconnecting second posture during an off condition of said vending effecting means; and coin slide means mounted on said housing and movable from a coin receiving position to a position for initiating said vending operation, said coin slide means operable through a first coin slide insertion cycle for effecting actuation of said first switch means to said first posture and said second switch means to said power disconnecting second posture to maintain said power source disconnected from said vending effecting means and through a second coin slide insertion cycle for effecting actuation of said second switch means to said first posture while maintaining said first switch in said first posture to connect said power source and energize said vending effecting means whereby two coin slide insertion cycles are required for each vending operation.

4,493,411

SELF TUNING LOW FREQUENCY PHASE SHIFT COIN EXAMINATION METHOD AND APPARATUS

Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Sep. 29, 1982, Ser. No. 428,467
Int. Cl.³ G07F 3/02
U.S. Cl. 194—100 A **25 Claims**



1. A method for examining coins comprising the steps of storing information regarding the relationship between an acceptable phase shift and the frequency of a first signal comprising a low frequency electrical signal,

generating the first signal with a first inductor located on one side of a coin passageway,

monitoring the frequency of the first signal,

receiving a portion of the first signal which is transmitted across the coin passageway, said portion received with a second inductor located on the other side of the coin passageway, and producing a second signal,

measuring the phase shift between the first signal and the second signal when a coin is between the first and second inductors,

determining an acceptable phase shift for an acceptable coin based upon the monitored frequency of the first signal and the stored information, and

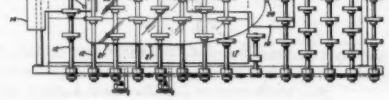
comparing the measured phase shift and the acceptable phase shift to determine if the coin is an acceptable coin.

4,493,412

GLASS SHEET POSITIONING APPARATUS FOR CONVEYOR PLATFORM

Richard J. Krehnovi, Mansfield, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 25, 1982, Ser. No. 392,393
Int. Cl.³ B65G 47/26
U.S. Cl. 198—434 **8 Claims**



1. An apparatus for positioning a sheet in a predetermined

location in a sheet pick-up station located on a platform, comprising:

a plurality of sheet engaging means;

stopping means disposed about one end of the sheet pick-up station for stopping the sheet in the sheet pick-up station;

a first table disposed on one side of the sheet pick-up station, said first table having holes arranged in a plurality of rows and columns for receiving at least one of said sheet engaging means;

a first means for reciprocating said first table between a sheet engaging position wherein at least one of said said sheet engaging means engages a side edge of the sheet on the platform, and a non-sheet engaging position;

a second table disposed on the opposite side of the sheet pick-up station, said second table having holes arranged in a plurality of rows and columns for receiving at least one of said sheet engaging means;

a second means for reciprocating said second table between a sheet engaging position wherein at least one of said sheet engaging means engages the opposite side edge of the sheet on the platform, and a non-sheet engaging position;

a third table disposed about the opposite end of the sheet pick-up station, said third table having holes arranged in a plurality of rows and columns for receiving at least one of said sheet engaging means;

a third means for reciprocating said third table vertically upwardly and downwardly relative to the platform, between a first position wherein said third table and said at least one of said sheet engaging means carried thereby are disposed below the plane of the platform, and a second position wherein said at least one of said sheet engaging means carried by said third table at least partially projects above the plane of the platform;

a fourth means for reciprocating said third table, when it is in its said second position, between a sheet engaging position wherein at least one of said sheet engaging means engages the end of the sheet on the platform, opposite said stopping means and a non-sheet engaging position; and

wherein said first, second, third and fourth reciprocating means cooperatively function to first move said first, second, and third tables, respectively into their said sheet engaging position, to position the sheet into the predetermined location, and to secondly move said first, second, and third tables, respectively, into their said non-sheet engaging position to provide clearance for the sheet to be manipulated.

4,493,413

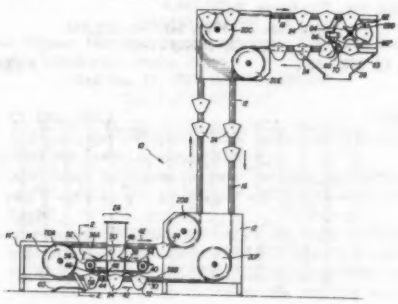
BUCKET CONVEYOR ASSEMBLY

John C. Harrell, 721 Riverview Dr., Suffolk, Va. 23434

Filed Jan. 25, 1982, Ser. No. 342,434

Int. Cl.³ B65G *17/36*

U.S. Cl. 198—708 **7 Claims**



1. A bucket conveyor assembly comprising:

a bucket endless conveyor including an endless flexible means for carrying longitudinally-spaced buckets attached thereto in a closed path, said closed path being defined by pulley means located at corners of said closed path for engaging and guiding said endless flexible means, said main bucket endless conveyor including a substantially horizontal section having an upper flight traveling in a first direction and a vertically-spaced lower flight traveling in an opposite direction;

a cover endless conveyor comprising an endless flexible means for carrying longitudinally-spaced covers attached thereto in a closed path, said covers being of a sufficient size to span longitudinal spaces between said buckets, said cover endless conveyor being located inside said horizontal section of said bucket endless conveyor, between said upper and lower flights, and being positioned parallel to said lower flight;

driving means for driving said bucket endless conveyor and said cover endless conveyor in the same direction and at such speeds that said covers of a lower stretch of said cover endless conveyor are superimposed with spaces between said buckets on said lower flight of said bucket endless conveyor at a loading zone;

a bucket-loading means for gravity-feeding goods to be loaded between upper and lower flights of both said bucket endless conveyor and said cover endless conveyor into buckets on said lower flight of said bucket endless conveyor at said loading zone; and

a bucket tilter downstream of said loading zone, but before said cover is lifted away from said space between said loaded buckets, for suddenly tilting said buckets forwardly.

4,493,414

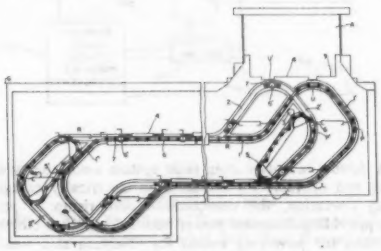
CONVEYOR ELEVATOR APPARATUS

Jacob I. Nevo-Hacohen, 150 Longwood Ave., Brookline, Mass. 02146

Continuation of Ser. No. 284,441, Jul. 17, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,226

Int. Cl.³ B65G *17/18*

U.S. Cl. 198—800 **16 Claims**



1. In conveyor elevator apparatus having a pair of substantially co-extensive main closed-loop channels and a pair of substantially co-extensive follower closed-loop channels, said pairs of channels being longitudinally staggered, each channel having upper and lower horizontal sections adapted for movement of platforms therealong in opposite horizontal directions, respectively, said main channels receiving main conveyors mounting successively spaced horizontal platforms supported near one end by attachment to the main conveyors and supported near the other end through follower means that ride in said follower channels, and so that each platform is supported at four points at all times, the combination of longitudinally staggered direction-changing transverse end portions at an end of each of the main and follower channels transversely connecting their respective upper and lower horizontal sections, each end portion defining two sloping sections and an adjacent vertical section by which the platforms move transversely

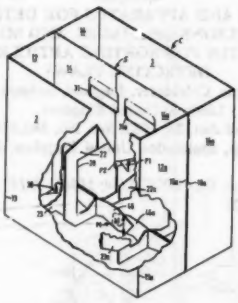
between the upper and lower horizontal sections; and a pair of auxiliary conveyor means disposed adjacent said direction-changing end portions of the follower channels, respectively, and engaging the follower means of the platforms at the vertical section and at least one of the sloping sections of each of those end portions so that the auxiliary conveyor means is compelled to move in synchronism with such follower means, the length of the auxiliary conveyor means being less than the length of the adjacent transverse end portions but sufficient always to engage the auxiliary conveyor means with the follower means of at least two platforms, with one such platform at said one of the sloping sections of an end portion when another is at the vertical section thereof, to enable each platform moving along a vertical section of an end portion to remain stable horizontally due to engagement of the auxiliary conveyor means with the follower means of a platform at said sloping sections of that end portion.

4,493,415

BASKET-STYLE ARTICLE CARRIER WITH MEDIAL SEPARATOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 28, 1983, Ser. No. 461,808
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—175 **4 Claims**



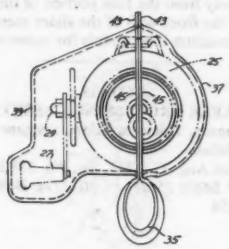
1. A blank (1) for forming a cellular basket-style carrier (c) which blank comprises a pair of central panels (2, 3) respectively providing side walls of the carrier, one of said central panels (2) having a base panel (5) hinged thereto for forming the base of the carrier and the other of said central panels (3) having a connecting flap (10) hinged thereto for joining the base panel to said other central panel, each of said central panels having a pair of end wall panels (12, 12*a*; 16, 16*a*) hinged thereto and each of said end wall panels having a medial panel (14, 14*a*; 18, 18*a*) hinged thereto, said medial panels together providing both a central longitudinal partition structure (S) of the carrier and transverse partition structures on either side of said longitudinal partition structure when the carrier is erected, the medial panels (18, 18*a*) associated with one of said central panels (2, 3) having a separator panel (46, 46*a*) hinged thereto for providing together a multi-ply separator (M) centrally of the carrier in the plane of said longitudinal partition structure, each of said transverse partition structures comprising a main transverse partition panel (22, 22*a*; 34, 34*a*) hinged to the medial panel, a supplementary transverse partition panel (23, 23*a*; 35, 35*a*) hinged to the main transverse partition panel, and an anchoring tab (24, 24*a*; 36, 36*a*) hinged to the supplementary transverse partition panel, characterized in that each of said separator panels is struck partially from the medial panel to which it is hinged and partially from the main transverse partition panel associated with that medial panel.

4,493,416

TAMPER PROOF REEL PACKAGE FOR A FISHING ROD

Kenneth Steinman, 1901 W. Lafayette Blvd., Detroit, Mich. 48216

Filed Jun. 20, 1983, Ser. No. 505,887
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—315.11 **1 Claim**



1. A tamper proof anti-theft reel package for a fishing rod having a handle and a reel mounted thereon;
comprising a unit molded sheet of plastic material having an elongated tubular body adapted to extend around the rod handle;
a pair of opposed cup shaped reel enclosing halves extending from said tubular body as a continuation thereof, adapted to protectively enclose the reel;
each of said halves terminating in opposed engaging marginal flanges;
said marginal flanges being arranged outwardly of the front, rear and top of said cup shaped halves;
and fastening means peripherally interconnecting and securing said flanges together;
said cup shaped halves extending mid-way of the length of said body;
the opposed engaging marginal flanges upon said cap shaped halves for the reminder of the length of said body extending substantially to the top of said cup-shaped halves and forwardly thereof forming a stiffened flat mount card;
said latter flanges having registering apertures therethrough adapted to receive a pegboard;
said tubular body functioning as a hinge for enclosing said handle and upon opening of said body halves facilitating removal of the rod and reel from said package.

4,493,417

STORAGE DEVICE FOR FLAT RECORDING MEDIA

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Filed Dec. 23, 1983, Ser. No. 565,120
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247796
Int. Cl.³ B65D *85/672*; A65D *6/06*; A47B *88/04, 97/00*
U.S. Cl. 206—387 **18 Claims**

1. A storage device for flat recording media comprising:
(a) a housing having a bottom wall, a top wall, two elongate side walls, a rear wall, and an open front side;
(b) a slider member for receiving at least one recording medium, the slider member being movably mounted in the housing and having a base portion and a front wall;

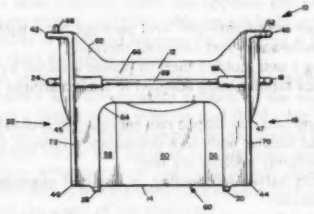
(c) means for biasing the slider member to an open position out of the housing;
(d) means for locking the slider member to a closed position within the housing against the bias of the biasing means; and
(e) lifting means for supporting and engaging underneath the recording medium, said lifting means when the device is in the open position raising the recording medium to a lifted position away from the base portion of the slider member and above the front wall of the slider member so that the recording medium is accessible for removal and insertion.

4,493,418

WAFER PROCESSING CASSETTE

Douglas M. Johnson, Waconia, Minn., assignor to Empak Inc., Chanhassen, Minn.

Filed Aug. 17, 1983, Ser. No. 523,851
Int. Cl.³ B65D *25/28, 85/30, 1/34;* B65G *3/00*
U.S. Cl. 206—454 **3 Claims**



1. Wafer cassette comprising:
a. plurality of opposing wafer dividers, each of said dividers including a rounded tooth geometrical configuration and being substantially rounded along the perimeter of a wafer for encompassing and conforming to the circumference of a wafer;
b. upper and lower opposing longitudinal horizontal supports supporting said wafer dividers;
c. plurality of opposing upper and lower edge members and opposing rounded vertical side members for supporting said wafer dividers;
d. rear-end member including a substantially downward arch providing an open top portion and secured to said side members; and,
e. open H-bar end front member, said H-bar end including opposing vertical reinforcing edge members, a horizontal H-bar member running therebetween, said horizontal H-bar member including a reinforcing sectioned cylindrical rod, a reduced cross-sectional portion therebetween, and an upper ramped portion and a lower rounded open portion about said H-bar whereby said open area of said H-bar end, said rear end, and between said wafer dividers divides for structural integrity and non-restricted open surface automated processing of wafers, thereby providing a structurally integral wafer cassette for integrated circuit automated processing of said wafers in a wafer cassette.

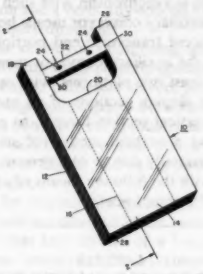
4,493,419

THERMOPLASTIC BAG AND BAG PACK

Randolph D. Prader, Fairport; Gordon L. Benoit, Macedon, and Robert T. Maddock, West Rush, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,487
Int. Cl.³ B65D *1/34, 6/04*
U.S. Cl. 206—554 **7 Claims**

1. A bag pack comprising a plurality of stacked thermoplastic film bag structures, each bag comprising a front and rear bag wall and an open mouth top portion, said open mouth portion being characterized by having handles which are integral extensions of said walls, said handles being located at opposite ends of said mouth portion, said handles being in association with but detachable from bag bonding means bonding said bag structures into a bag pack, said bonding means



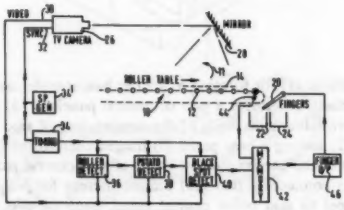
comprising at least one web detachably but continuously extending from one oppositely disposed handle to the other, said webs being thermally bonded together by way of at least one heat formed orifice also serving as a suspension means for said pack.

4,493,420

METHOD AND APPARATUS FOR DETECTING BOUNDED REGIONS OF IMAGES, AND METHOD AND APPARATUS FOR SORTING ARTICLES AND DETECTING FLAWS

Timothy J. Dennis, Colchester, England, assignor to Lockwood Graders (U.K.) Limited, United Kingdom

Filed Jan. 28, 1982, Ser. No. 343,574
Claims priority, application United Kingdom, Jan. 29, 1981, 8102752
Int. Cl.³ B07C *5/34;* H04N *7/18*
U.S. Cl. 209—587 **19 Claims**



17. Article sorting apparatus comprising:
conveying means for conveying through an inspection region articles having predominantly a first value of surface reflectivity but bearing occasional surface features having a second value of reflectivity which is substantially different from the first value;
means for illuminating each article in the inspection region;
sensing means responsive to radiation reflected from the article for scanning the inspection region to derive an image signal and for processing the derived image signal, said sensing means including:
(a) scanning means for scanning the image to produce a signal indicative of image intensity at a plurality of successive picture points;
(b) means for deriving difference values between neighboring points in a plurality of directions to determine the presence of positive-going and negative-going region boundaries;

(c) means for labelling successive picture points on the scan according to whether or not they lie within a predetermined number of successive picture points in a specified direction from a region boundary to thereby extend each of the said boundaries by the said predetermined number of picture points, said boundary extension being such that both positive-going and negative-going parallel boundaries are extended in the same direction; and

(d) time-shift means for applying time-shifts to the extended boundaries, the time-shift applied for a positive-going boundary being different from that applied for a negative-going boundary, to thereby superimpose the extended boundaries for a region lying wholly within the bounded region of the image thereby to generate an output signal;

said article sorting apparatus further comprising deflection means responsive to the said output signal to cause the article bearing such feature to be routed differently from the other articles.

4,493,421

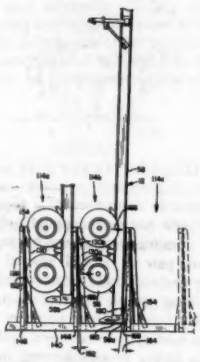
SIDE-LOADING CONTAINER CHASSIS STORAGE RACK

Randall W. Matthewson; Earl H. Benefiel, and Ronald A. Brudi, all of Longview, Wash., assignors to Brudi Equipment, Inc., Kelso, Wash.

Continuation-in-part of Ser. No. 300,261, Sep. 8, 1981, Pat. No. 4,427,117. This application Sep. 30, 1982, Ser. No. 429,039

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—13 **9 Claims**



1. A side-loading rack for storing wheeled container chassis having an elongated chassis frame projecting forwardly from rear, ground-engaging wheels, the rack comprising:

rack frame means defining a plurality of stalls, including first and second upright frame means spaced laterally apart to define a side of each stall and to form an opening on one side of the rack for receiving a container chassis sideways in a generally vertical orientation;

a first chassis support means at one side of each stall for supporting the rear wheels of the chassis on the first frame means above ground level;

a second chassis support means at the opposite side of each stall and at a level spaced above the first support means for supporting a forwardly-projecting portion of the container chassis frame in a generally upright position with the wheels of the chassis supported against the first support means; and

a third chassis support means at said opposite side of each stall and at a level below said first chassis support means for supporting a rear end portion of said chassis when said rear wheels and said forwardly-projecting portions of said chassis are supported, respectively, against said first and second chassis support means.

4,493,422

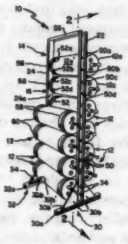
FIXTURE FOR MOUNTING CYLINDRICAL CAVITY FILTERS

Daniel P. Kaegebein, Depew, N.Y., assignor to TX RX Systems, Inc., Angola, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,902

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—26 **16 Claims**



1. An assembly comprising:

at least one rigid cylindrical article having a given length;

a frame including a pair of mounting members and means positioning same in an essentially parallel relationship with facing surfaces of said mounting members spaced apart through a distance essentially corresponding to said given length; and

attachment means attaching opposite ends of said article one to each of said mounting members, said attachment means including at least two pairs of pins supported one pair on each of said mounting members projecting from said facing surfaces in an essentially aligned relationship with the pins of each pair spaced apart through a distance simultaneously engaging a cylindrical side surface of said article adjacent its ends, and strap means encircling said ends of said article and pairs of pins clamping said pairs of pins in engagement with said side surface.

4,493,423

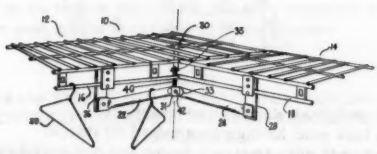
CORNERING DEVICE FOR A GARMENT SUPPORT STRUCTURE

Oscar E. Kaeslin, 1444 SW. 27th Ct., Fort Lauderdale, Fla. 33315, and Monroe H. Schenker, 7622 Sierra Dr. West, Boca Raton, Fla. 33433

Filed Mar. 24, 1983, Ser. No. 478,363

Int. Cl.³ A47K *10/04*

U.S. Cl. 211—123 **4 Claims**



1. A cornering device for a garment support structure, the garment support structure including first and second horizontal transverse assemblies, said horizontal transverse assemblies including planer shelving elements and pole elements, each pole element associated with a corresponding shelving element, the shelving elements and their respective pole elements having a mutual intersection near the corner of the walls to which said shelving and pole elements are normally secured, in which the present inventive cornering device comprises:

(a) first and second elongate rod elements having respective first and second ends;

(b) means for suspending the first end of each of said first and

second elongate rod elements at a fixed distance from and beneath the poles of said garment support structure; and

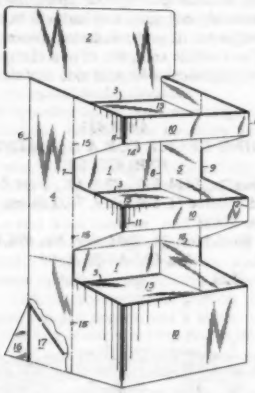
(c) means for mutually securing said second ends of both elongate rod elements at substantially the line of intersection between said first and second transverse assemblies, said securing means including means for securing said second ends of said rods at a vertical offset beneath said shelves in a desired parallel plane beneath the plane of said shelving, said offset corresponding, in terms of said plane, to the offset at which said first ends are secured beneath the poles of said garment support structure, said securing means further comprising means for defining an intersection of said first and second rod elements at an included acute angle in the range of 15° to 75°, whereby said rod elements will, at three points mutually defining a triangle, connect to the poles and shelves of the garment support structure to thereby define a plane parallel to the plane of said poles and shelving and at a distance therebelow defined by each of the three vertical offsets existing between the cornering device and the garment support structure and, further whereby, said acute angle of intersection of the first and second rod elements will enhance the ease of accessibility of garments hung in a corner area and will increase the number of germents that can, without sacrifice of accessibility, be supported within a corner area of the garment support structure.

4,493,424

FOLDABLE DISPLAY STAND

Irving Smith, 2078 White Plains Rd., Bronx, N.Y. 10462

Filed Oct. 9, 1981, Ser. No. 310,078
Int. Cl.³ A47F 5/11
U.S. Cl. 211—149 **14 Claims**



1. A foldable display stand comprising:

a back panel having a longitudinal slit therein;

a pair of side panels each having first and second opposing edges, the first edge of each side panel hingedly connected to opposing side edges of said back panel such that each of said side panels can be positioned in substantially the same plane as said pack panel;

a front panel having first and second opposing sides hingedly attached to said second edge of said side panels, said front panel being in a plane substantially parallel to said back panel;

a shelf hingedly attached to an edge of said front panel connecting said first and second sides of said front panel, said shelf extending from said front panel through said slit in said back panel, said shelf and slit being dimensioned such that the entire shelf can pass through said slit;

and biasing means for urging said side panels into substantially parallel planes.

9. A sheet for assembly into a foldable display stand having a vertical fold at about the midpoint thereof so as to divide the sheet into first and second sections;

said first section having a pair of spaced vertical fold lines so as to define a back panel therebetween and a pair of side panels attached to said back panel;

a horizontal slit in said back panel;

said second section having a pair of spaced vertical fold lines so as to define a front member therebetween and a pair a side members attached to said front member;

a pair of spaced horizontal scores in said front member;

a horizontal fold line between said pair of spaced horizontal scores and spaced therefrom; and

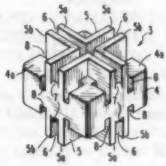
a pair of vertical scores extending along said pair of spaced vertical fold lines of said second section from one of said pair of spaced horizontal scores to said horizontal fold line.

4,493,425

RACK ASSEMBLY APPARATUS

Tsukasa Yoshida, 15-202 Nikko Danchi, 1-3 Nikko-cho, Fuchu-shi Tokyo, Japan

Filed May 12, 1983, Ser. No. 493,879
Int. Cl.³ A47B 47/00
U.S. Cl. 211—189 **6 Claims**



1. A rack assembly comprised of a plurality of connection members, transverse beams and panels wherein each connection member is comprised of a base having flat opposing surfaces, at least one pair of parallel, spaced apart panel support plates extending perpendicular from one of said flat surfaces to define a panel fitting groove therebetween, an engaging protuberance extending from said base adjacent an edge thereof and being located in said groove between said plates, at least one transverse beam fitting groove formed in said base adjacent one of said plates, an engaging protuberance located at the bottom of said transverse beam fitting groove, each of said panels having a rectilinear configuration with at least one engaging notch formed in an edge thereof in closely spaced relation to a corner thereof for engagement with the protuberance in the panel fitting groove when a corner of said panel is located in said panel fitting groove and said transverse beam having an engaging notch disposed adjacent each end thereof for engagement with said protuberance in said transverse beam fitting groove when an end of said transverse beam is disposed in said transverse beam fitting groove.

4,493,426

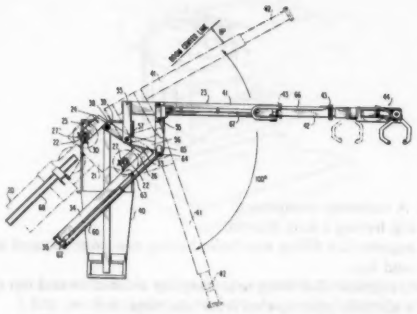
ATTACHMENT JIB FOR CRANES

Russell L. Sterner, Greencastle, Pa., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Oct. 13, 1981, Ser. No. 310,768
Int. Cl.³ B66C 23/04, 23/56; B65G 9/04
U.S. Cl. 212—261 **4 Claims**

1. An attachment jib for a crane boom comprising a support base adapted to be releasably coupled with a pair of existing parallel shafts on a crane boom, said support base comprising a frame having spaced opposite side arms adapted to straddle the nose block of a crane boom and the arms having engaging

elements at their ends adapted to be releasably locked in engagement with said existing projecting shafts on opposite sides of the nose block, a jib structure including at least one extensible and retractable section, a separate hydraulic cylinder inside said jib structure operable to extend and retract said section, a framework carrying the jib structure and projecting from one end thereof near the base of the jib structure, said framework comprising a box-like frame having one corner thereof pivotally connected to the support base between said side arms and



spaced from the longitudinal axis of the jib structure, an adapter element at the leading end of said jib structure adapted to be releasably coupled to a mating adapter element of various working devices, and hydraulic luffing cylinder means mounted on the support base and connected to a second corner of said box-like frame on one side of the support base in spaced relationship to the pivot axis of said box-like frame, whereby the attachment jib can be pivoted through a very wide luffing angle.

4,493,427

FLASK FOR STERILE LIQUIDS

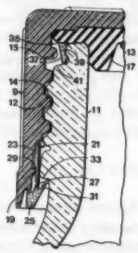
Alexander Wolkonsky, Fribourg, Switzerland, assignor to Stericric SA, Switzerland

Filed Jun. 8, 1983, Ser. No. 502,124

Claims priority, application Switzerland, Jun. 10, 1982, 3603/82

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—230 **9 Claims**



1. A flask for sterile liquids capable of supporting a terminal sterilization of pharmaceutical quality, comprising a body provided with a neck, a tamper-proof closure comprising a cap screwed on the neck of the flask, and a locking ring formed in two parts axially superposed and joined by a breakable zone, one of the parts being axially carried away by the cap during opening of the flask and the other part being held axially by a shoulder formed on the neck, characterized in that the cap encloses a seal made of elastomeric material capable of withstanding sterilization of the flask without important deformation, said seal being inserted between the bottom of the cap and the edge of the neck; the seal is axially held by the cap and comprises a skirt applying itself against the inner surface of the neck in a bacteriologically sealproof manner along a height sufficient to ensure a bacteriologic[illegible] closure seal until the locking ring is broken; the locking ri[illegible] in unbroken condition is completely concealed by the cap; [illegible]dial clearance is provided on either side of the locking ri[illegible], which is sufficient so that, after breaking of the locking ring, that part of the ring which is held by the neck shoulder falls and rests on a shoulder of the flask when the flask stands upright, and the said falling part is of a colour contrasting with that of the flask, and the length of the neck being sufficient for a segment of the neck to be visible between that part of the ring resting on the shoulder of the neck and the lower edge of the cap when the said cap is secured back on the neck.

4,493,428

FREIGHT CONTAINER, IN PARTICULAR FOR AIR FREIGHT

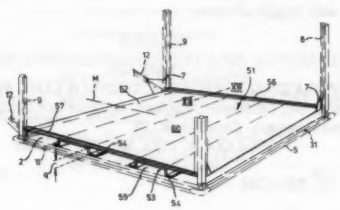
Gerhard J. Mittelmann, Öhningen, and Ricardo W. Liebherr, Engen, both of Fed. Rep. of Germany, assignors to Schweizerische Aluminium AG (Swiss Aluminium Ltd.), Chippis, Switzerland

Filed Oct. 21, 1983, Ser. No. 544,107

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1983, 3332797

Int. Cl.³ B65D *88/16*

U.S. Cl. 220—1.5 **14 Claims**



1. A freight container, in particular a lightweight container for air freight, comprising a support frame structure which is secured to a container bottom and which is formed from shaped bars or like strut members and which is at least partially covered or clad by a skin formed by sheet metal plates, fabric means or the like flat members, with a door being provided within at least one panel of the frame, characterized in that an intermediate bottom member having channel-like profile means at its underside is provided in the interior of the container on the bottom plate, and is releasably connected to the bottom plate and/or to the support frame structure.

4,493,429

ARRANGEMENT FOR OPENING AND CLOSING A COVER OF A TRANSPORT AND TREATMENT CONTAINER

Dieter Pistor, and Ludwig Mankut, both of Altdorf, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,548

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3151244

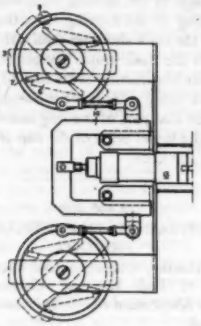
Int. Cl.³ B65D *55/00*

U.S. Cl. 220—211 **22 Claims**

1. An automatic arrangement for opening and closing a cover of a transport- and treatment container, comprising:

at least one toggle closure carrying the cover and engageable in said container to fix the cover on the latter, said toggle closure being movable between an open position in

which it removes the cover from the container and a closed position in which it applies the cover onto the container; and at least one gripping means having an axis and being turnable about its axis and arranged to move said toggle closure between said open and closed position, said gripping means being engageable with said toggle



closure, said gripping means having two cams, and said toggle closure having cam-receiving means arranged so that said cams are positioned at opposite sides of said toggle closure and engaged in said cam-receiving means when said gripping means are turned to be engaged with said toggle closure.

4,493,430

FLOATING ROOF SEAL USING A COIL SPRING

Swan K. Sie, Middlesex, England, assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Oct. 4, 1982, Ser. No. 432,655

Int. Cl.³ B65D *88/46*

U.S. Cl. 220—224 **3 Claims**

1. In a vertical cylindrical liquid storage tank of imprecise circularity having a circular floating roof with an outer cylindrical vertical wall of smaller diameter than the tank thereby defining a vapor space between the roof wall and the tank wall, the improvement comprising:

a resilient seal located in and spanning the vapor space between the tank wall and the roof wall;

the seal including a vapor resistant flexible longitudinal strip of material having parallel longitudinal edges attached to the roof defining a horizontal pouch extending around the roof periphery; and

a horizontal coil spring, located in the pouch for the length of the vapor space, with one side of the spring in contact with, and jointed to, the roof wall by spaced apart clips.

4,493,431

CAN OPENING MEANS

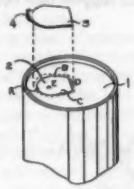
Sung N. Cho, San 16-75, Dae Chi-Dong, Kang Nam-Ku, Seoul, Rep. of Korea

Filed Apr. 16, 1982, Ser. No. 369,252

Claims priority, application Rep. of Korea, Apr. 24, 1981, 2934

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—269 **6 Claims**



1. A container comprising:

a top having a hole therein,

a segment for filling said hole, having one edge secured to said top,

said segment also being non-frangibly secured to said top at a discrete point spaced from said edge, and

means for covering said segment and a portion of said top, for sealing said container.

4,493,432

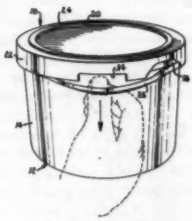
TAMPER EVIDENT CLOSURE

Ernest L. Smith, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.

Filed Dec. 7, 1983, Ser. No. 558,892

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **7 Claims**



1. A closure for an open topped food container having a top rim presenting a lip thereon, said closure comprising:

a lid having a size to cover the open top of the food container when applied thereto;

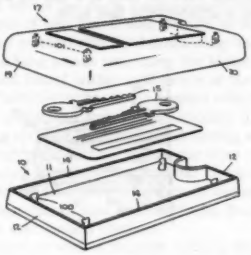
a skirt projecting from said lid at a location to substantially surround the container rim outwardly thereof when the lid is applied to the container;

a detachable lock ring connected to said skirt along a weakened tear line establishing a hinge connection about which the lock ring can be folded inwardly to a locking position wherein said skirt encloses said lock ring and the lock ring engages the lip of the container rim to lock said lid on the container, whereby removal of the lid requires said lock ring to be torn away from said skirt along said tear line.

4,493,433
SELF-LOCKING PILFER PROOF TAMPER EVIDENT CONTAINER

Leonardo Sideri, 561 Broadway, New York, N.Y. 10012, and Enzo Del Brocco, Stamford, Conn., assignors to Leonardo Sideri, New York, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,914
Int. Cl.³ B65D *41/16, 41/18, 49/12*
U.S. Cl. 220—306 9 Claims



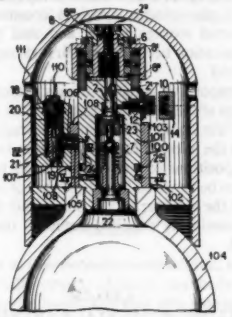
1. A non-reusable self-locking container comprising:
a first panel including a surface, side walls extending generally orthagonally from said surface, and a first tab extending generally orthagonally from said surface within said side walls, said tab defining a cam and a locking surface
a second panel including a surface, walls extended generally orthagonally from said surface, and a second tab extending generally orthagonally from said surface within said walls, said tab defining a cam and a locking surface
said first and second cams being adapted to telescopically engage one another resiliently to flex one away from the other
said locking surfaces being adapted for mutual engagement permanently to lock said cams to one another
said side walls and walls being adapted to protect said cams and locking surfaces from disengagement
said first and second panels forming an enclosure which is permanently locked against entry upon completion of said telescoping movement, except by the permanent and visible destructon of said container.

4,493,434
VALVE SYSTEM FOR PRESSURIZED VESSELS

Holger Beaujean, Karlsruhe-Durlach; Willi Kamphausen, Erkelenz; Dieter Niephaus, Jülich, and Ove Nommensen, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 227,768, Jan. 23, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 472,061
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002768
Int. Cl.³ F17C *13/04*
U.S. Cl. 222—3 18 Claims

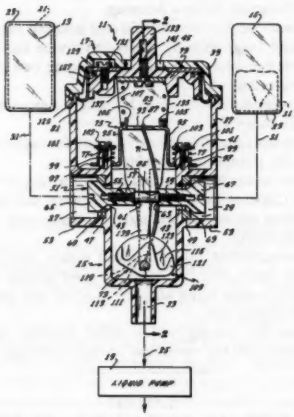
1. A pressure-retentive valve system for a vessel under a fluid pressure, said valve system comprising:
a valve housing having a chamber communicating with the interior of said vessel and affixed thereto, said chamber being provided with an inner seat proximal to said vessel and an outer seat spaced from said inner seat;
an inner valve member received in said chamber and engageable with said inner seat;
a prestressed spring in said chamber bearing upon said inner member and urging same in the direction of said inner seat;
an outer valve member in said chamber having a valve plate engageable with said outer seat, said inner valve member having a respective valve plate subjected to the pressure of fluid in said vessel and urged thereby against the respective seat;
a threaded element rotatable on said housing and threadedly connected to said outer valve member for displacing same toward and away from said outer seat, said inner valve member having a stem received in the valve plate of said outer valve member and forming an abutment therewith with lost motion between said valve members for opening of said inner valve member, said inner valve member being closed by said spring against said inner seat; and
first and second actuators respectively for said outer and inner valve members acting upon said valve members through said element.



4,493,435
LIQUID DISPENSING SYSTEM AND AUTOMATIC SELECTOR THEREFOR

E. Dale Hartley, Malibu, Calif., assignor to Product Research And Development, Anaheim, Calif.

Filed Nov. 10, 1982, Ser. No. 440,532
Int. Cl.³ B67D *5/08, 35/22*
U.S. Cl. 222—52 20 Claims



1. A dispensing system with automatic storage means selection, said dispensing system comprising:
first storage means for storing a liquid to be dispensed;
second storage means for storing a liquid to be dispensed, each of said storage means being essentially closed to the atmosphere at least when such storage means has at least some of the liquid removed therefrom;
a pump having an intake side and a discharge side;

a pressure responsive selector coupled to both of said storage means and the intake side of said pump;

said selector including linearly reciprocable valve means movable between a first position in which the selector provides communication between said first storage means and said pump and blocks communication between said second storage means and said pump and a second position in which the selector provides communication between said second storage means and said pump and blocks communication between said first storage means and said pump; and

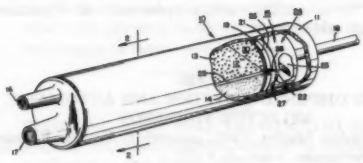
pressure responsive actuator means responsive to the pressure drop at the selector resulting from at least the partial arrest of the liquid flow from the storage means supplying liquid to the selector for moving the valve means from one of said positions to the other of said positions whereby liquid can be supplied from the other of said storage means through the selector to the pump and the storage means which previously supplied liquid to the selector can be replaced.

4,493,436

COMPARTMENTAL CARTRIDGE

Paul Brokaw, Cleveland, Ohio, assignor to Loctite Corporation, Newington, Conn.

Filed Mar. 16, 1983, Ser. No. 475,877
Int. Cl.³ B67D 5/52
U.S. Cl. 222—80 **25 Claims**



1. A cartridge for simultaneously dispensing at least two different materials, said cartridge comprising:

(a) an elongated hollow housing;

(b) at least one partition within said housing extending laterally and longitudinally thereof to divide the housing into at least two chambers each for holding one of said different materials;

(c) a plunger received in said housing for movement longitudinally thereof;

(d) a dispensing orifice in said housing for each of said chambers; the plunger comprising:

(e) piston means having a first face for acting on said materials to dispense them from said housing, said piston means including means for sealingly engaging said housing and said partition;

(f) severing means following said piston means and being spaced from said materials by said piston means, said severing means being adapted to sever said partition from said housing; and

(g) means for storing said severed partition so as not to interfere with the operation of said cartridge.

4,493,437

CAULKING GUN WITH CUTTER AND PIERCER

Kenneth S. Breeden, Louisville, Ky., assignor to Richard L. Caslin, Louisville, Ky.

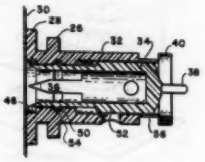
Filed Sep. 30, 1982, Ser. No. 429,950
Int. Cl.³ B67B 7/24
U.S. Cl. 222—82 **17 Claims**

1. In a caulking gun including a caulking tube-receiving barrel having a reciprocating plunger, and a pistol grip-type handle secured to one end of the barrel, a pivot means carried near the top portion of the handle, and a trigger member pivotally mounted on the pivot and adapted for operating the said plunger; the invention comprising:

a. the said handle being of hollow construction, as well as the said trigger member being of hollow construction and tending to telescope into the hollow handle when the trigger is squeezed;

b. a hole formed in one side wall of the handle near the said pivot means;

c. one side wall of the trigger that is nearest the said side wall of the handle with the hole in it having an open notched edge that is adjacent the said hole;



d. and a replaceable keen-edge blade positioned within the said trigger and within the said open notched edge, and an adjustable fastening means within the trigger for clamping the blade in place in the open notched edge of the trigger wall;

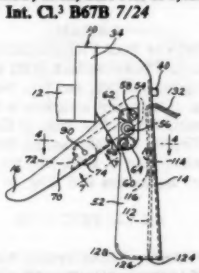
e. whereby the said hole in the handle in cooperation with the blade in the open notched edge of one wall of the trigger serve as a cutting means for the tip of the nozzle of a caulking tube when the trigger is squeezed, said open notched edge of the trigger wall being generally positioned within the hollow handle so the blade is shielded from exposure to the user's hand.

4,493,438

FLUID DISPENSER

Christopher C. Rutter, 21063 Cabot Blvd., Hayward, Calif. 94545

Filed Jul. 9, 1982, Ser. No. 396,622
Int. Cl.³ B67B 7/24
U.S. Cl. 222—83 **5 Claims**



1. In combination with a flexible, sealed, fluid-containing bag, a two-piece dispenser comprising:

a tubular sleeve having at its first end a flange attached to the exterior surface of the fluid-containing bag, the longitudinal axis of said sleeve being substantially perpendicular to said bag surface covering the bore of said sleeve at said first end;

a tubular barrel slidably positioned within the bore of said tubular sleeve, said barrel having a first end adjacent the first end of said sleeve and said sealed bag surface,

opening means comprising a plurality of flexible elongated blades formed in the end of said barrel adjacent its first end, said blades having sharpened tips for piercing

through the surface of said fluid-containing bag covering the bore of said sleeve;

locking means for preventing removal of said barrel from said tubular sleeve after said opening means has opened said fluid-containing bag, said locking means including a tooth radially extending from the outer surface of at least one of said flexible, elongated blades, and a first annular channel in the bore of said sleeve adjacent the first end thereof, said tooth being positioned to engage said channel when said barrel has been longitudinally moved toward the first end of said barrel and the tips of said elongated blades have pierced said fluid-containing bag; and

temporary locking means restricting the longitudinal movement of said barrel within said sleeve at the point where the tips of said blades are not in contact with the surface of said fluid-containing bag, said temporary locking means including a second annular channel having a substantially semicircular cross-section within the bore of said sleeve and displaced from said first annular channel toward the second end of said sleeve, said tooth radially extending from at least one of said flexible blades being in engagement with said second channel.

5. In combination with a flexible, sealed, fluid-containing bag, a fluid dispensing assembly including: a tubular sleeve having at its first end a flange attached to the exterior surface of the fluid-containing bag, the longitudinal axis of said sleeve being substantially perpendicular to said bag surface covering the bore of said sleeve at its first end, said sleeve having an annular channel with a substantially semicircular cross-section within the bore of said sleeve and displaced from said first end surface; and a removable tubular barrel adapted to slidably fit within the bore of said sleeve, said removable barrel comprising:

an inner tubular barrel having sharpened blades at the first end and a tube fitting at the second end thereof, said inner tubular barrel having an annular groove with a substantially semicircular cross-section, said groove being displaced from the tips of said sharpened blades by an amount less than the displacement of said annular sleeve channel;

an outer tubular sleeve having an exterior surface substantially corresponding to the bore of said tubular sleeve attached to said bag, said outer tubular sleeve having a plurality of small ball-retaining holes in communication between its outer and inner surfaces and in an annular pattern overlying the annular groove in said inner tubular barrel whereby the small balls are recessed from the outer surface of said outer tubular sleeve and lie in said annular groove; and

spring means connected between said outer tubular sleeve and said inner tubular barrel and operating to force the first end of said inner tubular barrel outward from the corresponding end of said outer tubular sleeve to cause said sharpened blades toward said fluid-containing bag and to force said small balls from their recessed position in said annular groove into engagement with said annular channel in the bore of said sleeve that is attached to said bag.

4,493,439

COLLAPSIBLE DISPENSING CONTAINER

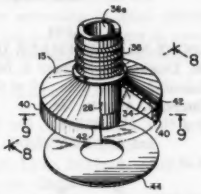
William Ledewitz, 31 Brookwood Dr., Woodbridge, Conn. 06525

Continuation-in-part of Ser. No. 284,826, Jul. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,663, Nov. 20, 1980, abandoned. This application Jan. 4, 1984, Ser. No. 568,281

Int. Cl.³ B65D *35/10*

U.S. Cl. 222—94 **3 Claims**

1. A collapsible container having a tubular body, a conical-shaped head portion affixed to one end thereof provided with a sloping shoulder portion and a peripheral flange portion, said flange portion extending parallel to the longitudinal axis of said tubular body and having a circumferential groove on an interior surface of said peripheral flange, a neck part provided with a threaded portion, a plurality of ribs extending parallel to the longitudinal axis of said tubular body and having the top edges thereof supporting said shoulder portion, a relatively thin, wafer-like apertured disc barrier member being supported and sealed in said head portion by said groove of said flange at said outer peripheral edge of said disc and by said neck part at the inner peripheral edge of said disc, said bottom edges of said



ribs being secured to the top surface of said disc, said neck part having a substantially central opening therein in communication with said tubular body, and said ribs extending laterally from said neck part to said flange portion and acting to strengthen the end of said collapsible tube having said head portion affixed thereto, while additionally supporting said barrier member, whereby a plurality of separate chambers are formed.

4,493,440

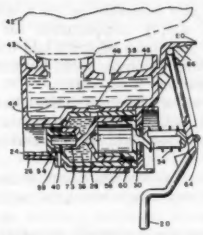
WALL-MOUNTED SOAP DISPENSER

John von Buelow, Woodland Hills, and Stephen G. Hauser, Tarzana, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Aug. 8, 1983, Ser. No. 521,488

Int. Cl.³ B67D *1/16*; B65D *88/54*

U.S. Cl. 222—109 **50 Claims**



1. A dispenser for liquids, pastes, and creams capable of being mounted on a vertical surface comprising:

a manual pumping mechanism including,

a pump housing providing a reservoir for liquid,

a pump chamber within said pump housing having at least one connecting opening to said reservoir, having a smaller chamber segment nearer the front of said mechanism and a larger chamber segment behind and co-axial with said smaller chamber segment, having a dispensing opening in said smaller chamber segment,

a piston having a smaller piston segment and a larger piston segment behind and co-axial with said smaller piston segment, having a piston rod on the end of and co-axial with said larger piston segment, having grooves on each of said piston segments with gaskets fit into said grooves so as to form a sliding-contact fit between said chamber segments and said piston segments, said piston rod having at its end a crossbar,

a lever pivoted at its upper end from the rear side of said pump housing and attached near its middle to said piston rod, said lever having a slot adapted and con-

structed to fit said piston into said lever, said crossbar having a flat at one end, said lever having a stop on its back side adapted and constructed so that after inserting said crossbar through said slot and rotating said crossbar by ninety degrees, said flat rests against said stop,

a spring means forcing said lever toward the rear of said dispenser, and

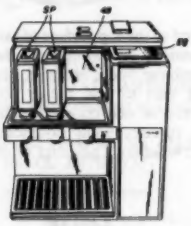
a means for attaching said mechanism to a vertical surface.

4,493,441

PORTABLE POST-MIX BEVERAGE DISPENSER UNIT

Jason K. Sedam, Dunwoody; Richard J. Mueller, Atlanta, and Andrew J. Holoubek, Stone Mtn., all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 12, 1981, Ser. No. 320,478
Int. Cl.³ B67D *1/00*
U.S. Cl. 222—129.1 **10 Claims**



1. A post-mix beverage dispensing system comprising:

a main cabinet portion having top, front, back, side and bottom walls with open compartments formed therein housing various components of the post-mix beverage system, said compartments including:

a water supply compartment for housing a water reservoir and an entrance chute therefor extending to said front wall,

a carbonator compartment for housing a carbonator tank,

a syrup supply compartment for housing replaceable syrup containers adjacent said front wall, and

a CO_2 supply compartment for housing a CO_2 cylinder adjacent said front wall;

said top wall of said main cabinet having openings therein providing access to said water reservoir, entrance chute, carbonator compartment, and said syrup supply compartment;

said front wall also having openings therein providing access to said syrup compartment and said CO_2 supply compartment;

a first access panel normally covering the openings in said front and top walls providing access to said syrup supply compartment;

a second access panel normally covering said openings in said top wall providing access to said water compartment and said carbonator compartment;

a third access panel at least covering the opening in said front wall providing access to said CO_2 supply compartment, said third access panel being movable to uncover said opening in said front wall to provide access to said CO_2 supply compartment;

water supply conduit means connecting said water reservoir and said carbonator tank;

pump means for pumping water from said water reservoir to said carbonator tank;

CO_2 supply conduit means connecting said CO_2 cylinder to said carbonator tank; and

a refrigeration system including,

a compressor,

a condensor, and

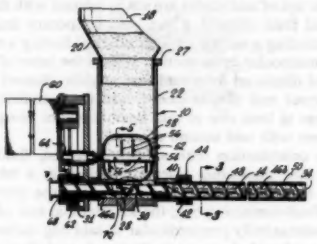
an evaporator coil, said evaporator coil having a main portion disposed in contact with said water reservoir for cooling said water, a second portion in heat transfer relationship with said carbonator tank, and a third portion in heat transfer relationship with said replaceable syrup containers.

4,493,442

VARIABLE RATE FOOD INGREDIENT DELIVERY APPARATUS

Harold W. Hanson, Jr., Newport Beach, Calif., assignor to Par-Way Manufacturing Co., Los Angeles, Calif.

Filed Jul. 13, 1981, Ser. No. 282,864
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—241 **15 Claims**



1. An apparatus for uniformly distributing a powdered or granular food product ingredient along a distribution zone of substantial length at a controlled variable rate comprising:

a hopper for holding a supply of said ingredient to be distributed;

a cylindrical tube extending from said hopper and communicating with the interior thereof, said tube having one or more openings through which said ingredient can pass arranged longitudinally therealong and extending throughout said distribution zone;

an auger disposed within said tube and said hopper to transport said ingredient from said hopper along said tube for distribution through said openings at a substantially uniform rate throughout said distribution zone, said auger including a central body having a relatively large diameter portion which extends into said hopper and a relatively small diameter portion which is disposed entirely within said tube extending along said distribution zone and not extending into said hopper, said auger further comprising a land extending around said central body and defining a generally helical flute to serve as an ingredient flow path, said flute having a relatively small cross-sectional area along said large diameter portion of said central body and a relatively large diameter portion along said small diameter portion of said central body; and

drive means for rotating said auger at a variable and adjustable speed to cause said ingredient to move longitudinally along said tube at a selected rate.

4,493,443

MULTIPOSITION VALVED DISPENSER

Ralph J. Bailey, 64 Derbyshire St., Derby, Conn. 06418

Filed Jun. 27, 1983, Ser. No. 508,045
Int. Cl.³ B67D *5/42*
U.S. Cl. 222—400.8 **16 Claims**

1. A multiposition valved dispenser for use with a pump and tap assembly of the type used for kegs, comprising:

on said pump and tap assembly, means for coupling and a flexible tube connected to said means for delivery of the keg fluid by way of said tube,

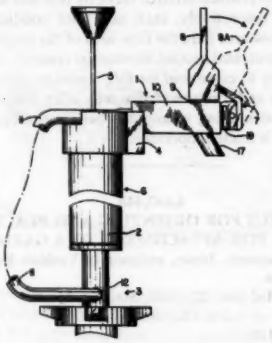
and further comprising;

a valve having means for effecting on states and an off state with respect to fluid flow, said valve including,

a housing, a spigot mounted on the housing for delivery of

the fluid by said dispenser and means for coupling said flexible tube to the housing for delivery of the fluid to the valve;

a first handle member rotably mounted on the valve for controlling the valve's on states by angular displacement of said handle away from a pre-determined off position with respect to the valve housing,



a second handle member detachably mounted on the first handle for moving same, and angled from said first handle so that said second handle establishes a new off position with respect to the valve housing, and

means for detachably mounting said valve housing on said pump and tap assembly.

4,493,444

SELF-CLOSING VALVE-AND-LID ASSEMBLY

Luigi Del Bon, 141, Feldstrasse, and Franco Del Bon, 139, Feldstrasse, both of 4663 Aarburg, Switzerland

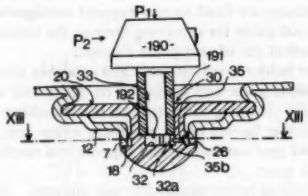
Continuation-in-part of Ser. No. 259,158, Apr. 30, 1981, Pat. No. 4,442,959, and Ser. No. 259,159, Apr. 30, 1981, Pat. No. 4,410,110. This application Feb. 9, 1982, Ser. No. 347,321

Claims priority, application European Pat. Off., Apr. 30, 1980, 81.105298; Switzerland, Aug. 5, 1980, 5912/80

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.22 **22 Claims**



14. A container lid being usable in a self-closing valve-and-lid assembly adapted for closing the open top end of a container fillable with pressurized product, which lid has a central axis, the periphery of said lid being adapted for sealing connection with a top rim of a container sidewall surrounding the said container top opening and extending in a plane generally transverse to said lid axis,

said lid having a central dome, a foot zone about said dome, a central opening in the middle of said dome and a collar portion protruding axially from said dome, about said central opening, and being rigid under conditions of filling product into, and discharging product from said container,

said lid having a flat lid part about said dome and extending generally in a main lid plane transverse to said central lid axis, between said periphery, being connectable to said top rim of said container sidewall, and said foot zone,

said dome having a top wall extending perpendicular to said lid axis and a circumferential sidewall which latter extends axially transverse to said main lid plane, and merges with said flat lid part in said foot zone,

said dome protruding upwardly from said flat lid part on the side of the latter adapted for being turned away from the interior of a container, and

said collar portion extending in axial direction upwardly from said dome top wall and having an annular rim, about said central dome opening, facing upwardly in axial direction.

4,493,445

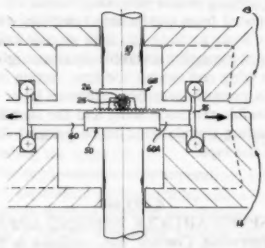
BODYFORMS

Eric R. Arthur, King's Lynn, England, assignor to A. E. Arthur Limited, King's Lynn, England

Filed Jun. 1, 1982, Ser. No. 383,831

Int. Cl.³ A41H *5/00*

U.S. Cl. 223—68 **10 Claims**



1. A bodyform comprising an upstanding central support, a plurality of pairs of opposed foamed plastics body sections around the central support, each body section having a recess, a locking adjustment mechanism for each pair of body sections, the mechanism being carried on the central support and adjustably supporting pairs of body sections, and an operating rod for each adjustment mechanism which projects laterally from the composite body formed by the body sections, the adjustment mechanism being arranged and coupled to the operating rod in such a manner that axial displacement of the operating rod in opposite directions respectively locks and unlocks the adjustment mechanism, while a rotational movement of the operating rod about its axis, in the unlocking condition of said rod, causes the adjustment mechanism to move the body sections of at least one opposed pair equally and oppositely relative the central support, thereby to adjust the dimensions of the relevant part of the composite body, each adjustment mechanism being connected in respective body sections by flanges which locate in the recesses and allow the body sections to be drawn toward and away from the central support.

4,493,446

MULTIPLE ROLL TAPE DISPENSER

Gary J. Wirth, Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Aug. 1, 1983, Ser. No. 519,282

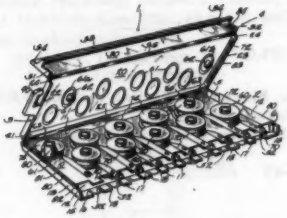
Int. Cl.³ B26D *1/02*

U.S. Cl. 225—21 **8 Claims**

1. A dispenser for a plurality of rolls of tape of the type having a layer of pressure sensitive adhesive comprising, in combination:

(1) a base member including a divider wall separating the base member into a tape storage compartment and a tape dispensing compartment;

(2) a first cover member hinged to the base member and extending over the tape storage compartment when in a closed position;
(3) a second cover member hinged to the first cover member and extending over the tape dispensing compartment when in a closed position;
(4) the tape dispensing compartment including
(a) a plurality of flexible retention wings extending from the divider wall,
(b) a plurality of guard fingers spaced from the flexible retention wings, and



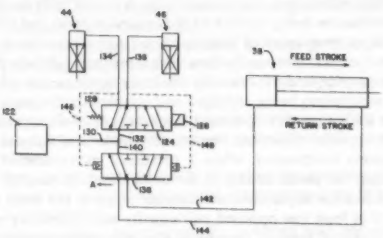
(c) tape cutting means extending across the guard fingers and spaced from the flexible retention wings;
wherein tape from a roll in the tape storage compartment of the dispenser is manually severable by drawing across a flexible retention wing and against the tape cutting means, following which its pressure sensitive adhesive layer is lightly adhered to a flexible retention wing and the tape has a free end portion extending therebeyond to be grasped for subsequent severance of the tape.

4,493,447

HIGH SPEED ARTICLE FEEDING APPARATUS

Harry J. Ledgerwood, Conway, Mo., assignor to Plessey Incorporated, Melville, N.Y.

Filed May 11, 1983, Ser. No. 493,608
Int. Cl.³ B65H *17/44, 17/36, 17/36*
U.S. Cl. 226—150 **10 Claims**



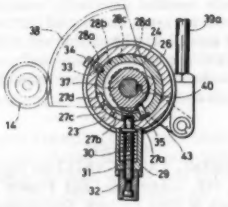
1. Feed apparatus for successively presenting articles to a work station for the performance of an operation thereon by a tool, said apparatus comprising:
(a) feeding means for conveying an article;
(b) first holding means including a fluid operated first actuator movable from a clamping position to an unclamping position to selectively clamp the article to the feeding means while it is being conveyed thereby and to subsequently release the article therefrom;
(c) second holding means including a fluid operated second actuator movable from a clamping position to an unclamping position to selectively hold the article in position at the work station while the operation is being performed thereon and subsequently release the article therefrom;
(d) said feeding means and said first and second holding means operable by a pressurized fluid control circuit, said circuit including a first directional control valve operatively connected to each of said first and said second holding means by first and second main flow conduits, respectively, to alternately operate the same, and a second directional control valve to operate said feeding means, said second directional control valve interconnected with said first and second main flow conduits of said first directional control valve by first and second pilot conduits, respectively, each said pilot conduit having a smaller flow area than the flow area of the respective main flow conduit, said second directional control valve operable thereby to cause said feeding means to execute a feeding stroke and a return stroke only after one of said first and second holding means, has been made operable and the other is made inoperable.

4,493,448

APPARATUS FOR ORIENTING AND PLACING A BUTTON FOR ATTACHMENT TO A GARMENT

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,544
Int. Cl.³ A41H *37/10*
U.S. Cl. 227—119 **6 Claims**



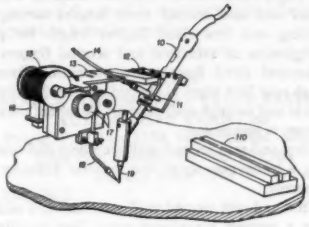
1. An apparatus for orienting and placing a button for attachment to a garment, comprising:
(a) a support;
(b) a guide mounted on said support and having a guide channel for guiding the button therethrough;
(c) a pusher slidably mounted in said guide for pushing the button through and out of said guide channel;
(d) a clinching die fixed to said support contiguous to one end of said guide for receiving thereon the button having been pushed out of said guide channel;
(e) a finger holder axially slidably and rotatably mounted on said clinching die and having at its upper end a pair of fingers for clamping the button on said clinching die, said finger holder having on its periphery a first gear;
(f) a second gear carried by said support and meshing with said first gear;
(g) a cylindrical holder secured to said support;
(h) an adjusting sleeve rotatably mounted in said cylindrical holder so as to be movable axially of said cylindrical holder to a limited extent;
(i) a shaft rotatably mounted inside said sleeve, said second gear being secured to said shaft;
(j) a fluid-pressurized cylinder operatively connected with said second gear for turning the latter through a predetermined angle; and
(k) means for adjustably regulating the extent to which said second gear is turned, said regulating means comprising a plurality of equidistantly spaced first recesses in a periphery of said sleeve, and a pin carried by said cylindrical holder and releaseably engageable with one of said first recesses which is chosen depending on the extent to which the button is to be turned.

4,493,449

SOLDERING TOOL FOR A ROBOT

William J. Kleiman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 6, 1982, Ser. No. 447,041
Int. Cl.³ B23K *3/00, 37/02*
U.S. Cl. 228—7 **12 Claims**



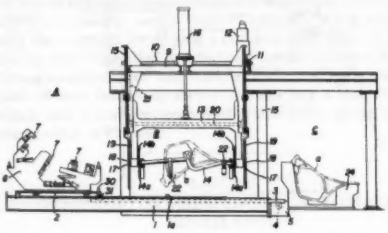
1. A soldering tool for a robot comprising:
a. a frame assembly for mounting said tool to said robot;
b. means for providing heat to a specified location on a workpiece, said heating means attached to said frame assembly;
c. means for guiding solder to said specified location upon command mounted on said frame assembly;
d. means for cleaning said heating means in cooperation with said robot; and
e. means for interconnection to said robot wherein said robot is for providing temperature control, timing control, and position control for said tool.

4,493,450

WELDING APPARATUS FOR VEHICLE BODY OF TWO-WHEELED VEHICLE

Katsutoshi Yurui, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 461,924
Claims priority, application Japan, Jan. 29, 1982, 57-11803; Jan. 29, 1982, 57-11804; Mar. 30, 1982, 57-50058
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—49 R **3 Claims**



1. A welding apparatus for a vehicle body of a two-wheeled vehicle comprising:
a machine base,
at least one lower jig carrier mounted on said machine for reciprocation between a first position and a second position ahead of said first position,
means on said machine base for reciprocating said lower jig carrier,
first clamping means for holding a workpiece on said lower jig carrier, said workpiece consisting of plural members which when welded at a first set and a second set of certain predetermined points constitutes said vehicle body,
a machine frame mounted over said machine base at said second position,
an upper jig carrier mounted on said machine frame for movement upwardly and downwardly relative to said machine base and for reciprocation between said second position and a third position ahead of said second position,
means on said machine frame for reciprocating said upper jig carrier,
means on said means for reciprocating for moving said upper jig carrier upwardly and downwardly,
second clamping means for holding said workpiece on said upper jig carrier,
means on said means for moving for reversibly changing the orientation of said upper jig carrier holding said workpiece by 180°, and
means at said second position for welding at least said first set of said certain predetermined points on said workpiece.

4,493,451

FILLING FISSURES IN METAL ARTICLES

Stephen D. Clark, Colne; Philip S. Wood, Barnoldswick, and Peter J. Fell, Steeton, Nr Keighley, all of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 5, 1982, Ser. No. 432,825
Claims priority, application United Kingdom, Oct. 17, 1981, 8131372
Int. Cl.³ B23P *6/04*
U.S. Cl. 228—119 **6 Claims**

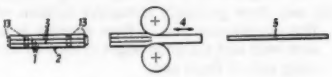
1. A method of filling a fissure in an article made from a superalloy including the steps of:
placing a powdered mixture of a superalloy, which is the same as the superalloy of the article, and a first brazing alloy of a given melting point in the fissure;
superimposing a further powdered brazing alloy thereon, said further brazing alloy having a higher melting point than the given melting point of the first brazing alloy of the powdered mixture;
heating the whole to a predetermined temperature and for a time period sufficient for melting the first brazing alloy of the powdered mixture so as to effect diffusion brazing of the powdered mixture of the superalloy and firt brazing alloy to provide a sinter with interstices; and
then further raising the temperature to effect melting of the further brazing alloy and filling therewith the interstices of the sinter which resulted from said diffusion brazing.

4,493,452

METHOD OF PRODUCING A PLATE OF STEEL

Thorwald Fastner; Max Mayrhofer, and Walter Taschner, all of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 25, 1981, Ser. No. 324,837
Claims priority, application Austria, Dec. 2, 1980, 5879/80
Int. Cl.³ B23K *20/04*
U.S. Cl. 228—158 **9 Claims**



1. A method of producing a plate of steel, in particular a plate having a thickness of more than 50 mm, by hot-rolling a prematerial in several passes, which method comprises the steps of
superposing at least two slabs of equal steel quality constituting said prematerial so as to obtain a pack,
securing said at least two slabs against displacement relative

to one another by applying stabilizing brackets on said pack, and

welding said at least two slabs by roll-bonding and reducing said pack in thickness.

4,493,453

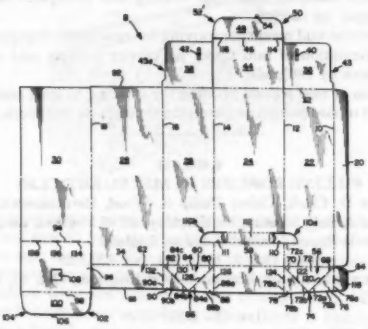
BOX FOR DISPLAY AND DISPENSING ARTICLES

Robert B. LeDrew, Newport News, Va., assignor to Williamsburg Packaging Corporation, Newport News, Va.

Filed Mar. 28, 1983, Ser. No. 479,813

Int. Cl.[3] B65D 5/72; A47F 3/02

U.S. Cl. 229—17 B **24 Claims**



3. A carton having a closure for one end thereof, comprising:

(a) said carton having four walls and with each of said four walls having a flap extension, each of said extensions having edges on either side thereof;

(b) each of said flap extensions being interconnected at its edges with adjacent flap extensions to form an endless series of flaps;

(c) said flaps forming first and second cooperating pairs of opposed flaps and each flap of said pairs having marginal edges;

(d) each flap of said first cooperating pair of flaps having a series of fold lines substantially forming three generally triangular sections, said three triangular sections including a generally shaped central isosceles triangle bounded on one side by a first triangle and on the other side by a second triangle and said first triangle being smaller than said second triangle;

(e) said second of said cooperating pairs of flaps having one flap of a width greater than the width of the opposite flap of said second cooperating pairs of flaps and said first triangle of each of said first cooperating pairs of flaps being adjacent the opposite flap of said second cooperating pair of flaps;

(f) each flap of said first cooperating pair of flaps having its marginal edges gradually increasing in width from one of said flaps of said second cooperating pair of flaps to the opposite flap of said second cooperating pair of flaps;

(g) said three generally triangular sections of each of said first cooperating pair of flaps being contiguous;

(h) said three generally triangular sections of each of said first cooperating pair of flaps meeting at an apex associated with said marginal edges of each of said first cooperating pair of flaps; and,

(i) whereby, when said second cooperating pair of flaps is folded inwardly prior to the folding of said first cooperating pair of flaps, said end closure will snap inwardly and remain below the plane of the bottom of said carton.

23. A blank for an insert, comprising:

(a) a flat member having first, second, third, fourth, fifth, sixth, seventh and eighth spaced parallel longitudinal score lines thereon defining a first wall member, a flat base, a second wall member, a third wall member, a first base member, a first wall support member, a connecting member, a second wall support member, and a second base member;

(b) said first wall support member having a plurality of first sized U-shaped slits defining a plurality of first sized flat fingers associated with said first wall support member;

(c) said second wall support member having a plurality of second sized U-shaped slits defining a plurality of second sized fingers associated with said second wall support member and said second sized fingers having a length exceeding said first sized fingers length for permitting interdigitation of said first and second fingers whereby said second sized fingers are prevented from passing through said first sized U-shaped slits to thereby maintain said first and second wall support members parallel when the insert is assembled;

(d) said first and said second wall members and said flat base having a transverse score line thereon defining an upper end thereof;

(e) said first and said second wall members and said flat base having a second transverse score line parallel to and spaced from said transverse score line for defining a lower end thereof;

(f) said first wall member having a first rectangular end wall extending from the upper end thereof and a second rectangular end wall extending from the lower end thereof;

(g) said flat base having an upper end wall extending from the upper end thereof and a lower end wall extending from the lower end thereof;

(h) said flat base upper end wall and said lower end wall each having a pair of angularly disposed score lines thereon; and,

(i) said second wall member having a first rectangular end wall extending from the upper end thereof and a second rectangular end wall extending on the lower end thereof.

4,493,454

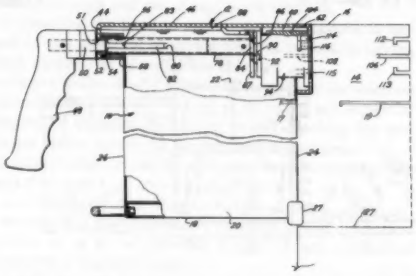
CASH COLLECTION RECEPTACLE

Charles W. Giebelhausen, Buffalo Grove, and Jose E. Davila, Bourbonnais, both of Ill., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 27, 1982, Ser. No. 424,398

Int. Cl.[3] G07B 15/00

U.S. Cl. 232—15 **11 Claims**



1. A collection receptacle for receiving cash from a farebox comprising in combination:

(a) a cashbox having an open top;

(b) a cover, said cover being pivotably attached to said cashbox at one edge of the top side of said cashbox and slidable with respect to the pivotal attachment to cover said top, said cover including means for interlocking with said cashbox when said cover is in the closed position to prevent pivotal movement of said cover in the closed position;

(c) a control handle attached to said cover, said handle being rotatable to two positions, one position preventing sliding

and pivotable movement of said cover when said cover is in the closed position and the other position permitting sliding and pivotal movement of said cover between the closed position and an open position, said handle including a shaft projecting therefrom and journaled through the cover; and

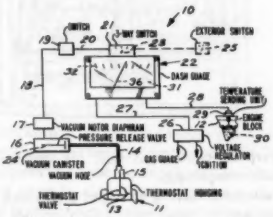
(d) a keyway member pivotally attached to the cashbox, said shaft slidably projecting through a key passage in the keyway member, a portion of said shaft including a key member cooperative with the opening to permit sliding movement of the shaft in the block only when the handle is oriented in a single position.

4,493,455

ADJUSTABLE THERMOSTAT VALVE SYSTEM FOR AUTOMOTIVE VEHICLES

Larry S. Pruett, P.O. Box 1358, Marietta, Ga. 30061

Filed Jun. 8, 1983, Ser. No. 502,108
Int. Cl.³ F01P 7/14
U.S. Cl. 236—34.5 **1 Claim**



1. An adjustable thermostat valve system for automotive vehicles, comprising, in combination, a valve housing mounted on an engine block, a vacuum operated valve stem in said housing operated by a vacuum hose secured at one end to a neck of said housing and to a vacuum canister at its other end, a vacuum motor diaphragm coupled to said vacuum canister by a cable, said diaphragm coupled to a relay switch coupled by cable to a three-way switch mounted on an electronic temperature gauge; a pressure release valve in said vacuum canister, cable to said temperature gauge being connected to a voltage regulator of said vehicle, and another cable to said temperature gauge being connected to a temperature sending plug threaded in said engine block; a face on said temperature gauge being calibrated in temperature degrees, a plurality of electric contacts at spaced locations along the calibrations of said face, a pointer arm in front of said face being engageable with said contacts for closing a circuit to said relay switch and causing said valve stem to insert and enable coolant circulation through a radiator of said vehicle; and a manually controlled knob on said three-way switch for electing a temperature at which said circuit between said temperature gauge and said relay switch is closable.

4,493,456

TEMPERATURE-RESPONSIVE AUTOMATIC VENTILATOR

Paul M. Sarazen, Jr., 214 Fairway Dr., and Dennis A. Beam, Westfield Rd., both of Shelby, N.C. 28150

Filed Sep. 30, 1982, Ser. No. 430,528
Int. Cl.³ F24F 13/14
U.S. Cl. 236—49 **10 Claims**

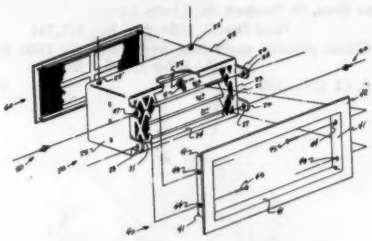
1. An improved foundation ventilator assembly comprising:

(a) a housing, said housing including side walls, a top wall and a bottom wall defining an air passageway therethrough;

(b) a collar associated with said housing, said collar having a first axially extending section with respect to said passageway and a second transversely extending section with respect to said passageway, at least one of said housing and said collar defining mounting means receiving openings therein, said openings including concentric portions of different diameter, said larger diameter portions being outside of said small diameter portions with respect to said air passageway,

(c) shutter means secured within said air passageway of said housing for pivotal movement thereabout, whereby when said shutter means are disposed transverse to a longitudinal axis through said passageway said passageway is closed and when disposed axial to said axis said passageway is open;

(d) means associated with said shutter means for pivoting same; and



(e) mounting means receivable in said mounting means receiving openings and adapted for manipulation to secure a portion of same within said foundation in the absence of predrilled openings therein, said mounting means including a threaded element having a pressure plate threadably received thereabout, said pressure plate being receivable in said large diameter portions of said openings and having means associated therewith to preclude rotational movement of same, whereby said mounting means received in said openings may be rotated for movement into said foundation with pressure produced thereby being absorbed by said pressure plates and said assembly.

4,493,457

METHOD AND APPARATUS FOR MAKING ARTIFICIAL SNOW

James L. Dilworth, Petoskey, and Robert J. Brinks, Alanson, both of Mich., assignors to Nubs Nob, Inc., Harbor Springs, Mich.

Filed Apr. 18, 1983, Ser. No. 473,071
Int. Cl.³ A01G 15/00
U.S. Cl. 239—25 **10 Claims**

9. A method of making artificial snow including the steps of:

generating a substantially unidirectional high-volume current of air;

injecting into said air current at an obtuse angle relative to the direction of said air current a high-velocity water spray from a location substantially above said air current and from a location substantially within a first quadrant of said air current;

injecting into said air current at an obtuse angle relative to the direction of said air current a high-velocity water spray from a location substantially below said air current from a location substantially within a second quandrant of said air current, said second quadrant opposite said first quadrant and;

injecting into said air current a high-velocity nucleated ice crystal spray comprising a mixture of water and compressed air from a location approximately in the center of said unidirectional high-volume current of air.

4,493,458

ROTARY SPRINKLER

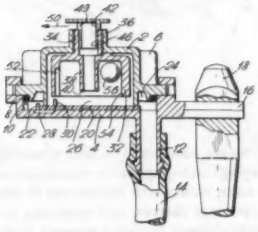
Dan Bron, 36 Palmach St., Haifa, Israel

Filed Dec. 3, 1981, Ser. No. 327,214

Claims priority, application Israel, Dec. 24, 1980, 61803

Int. Cl.³ B05B *3/02, 1/30*

U.S. Cl. 239—230 **16 Claims**



1. A pressure-regulated, rotating percussion sprinkler, comprising a two-part stationary housing, and an elastically stretchable diaphragm, the parts of said housing and said diaphragm being arranged so that said diaphragm divides the interior of said housing into a substantially peripheral inlet chamber and a central outlet chamber located above said diaphragm, said inlet chamber being provided with an inlet connector, the underside of said diaphram being accessible to the pressure prevailing in said inlet chamber, at least one substantially tangentially oriented passageway connecting said peripheral inlet chamber and said central outlet chamber, an inverted-cup-like rotor comprising a hollow shaft rotatably mounted in a first part of said two-part housing, and a tubular projection substantially aligned with said hollow shaft and extending inside said rotor, said cup-like rotor having a substantially annular peripheral wall, the inner surface of which is provided with at least one discontinuity constituted by a sudden and transient change of curvature and, in operation, serves as race for at least one spherical mass freely movable in the space delimited by said diaphragm and by the inside of said cup-like rotor, the bore of said hollow shaft terminating on the outside of said housing in at least one relatively narrow, nozzle-like opening producing a sprinkling jet, a flow of water introduced through said inlet connector entering said central outlet chamber via said tangentially oriented passageways producing a vortex flow and exiting said outlet chamber via said hollow shaft and said nozzle-like opening, said flow of water through said outlet chamber creating a pressure differential in said chamber relative to the pressure prevailing on the underside of said diaphragm to cause said diaphragm to bulge restricting the flow of water through said outlet chamber and seeking to equalize the pressure therein with that of said inlet pressure, wherein said vortex flow entrains said spherical mass, imparting to it an orbital movement upon and along said race, whereby, upon encountering, and prior to being carried by its angular momentum over said transient discontinuity, said spherical mass imparts an impulse-like, limited angular motion to said rotor and, thereby, to said sprinkling jet.

4,493,459

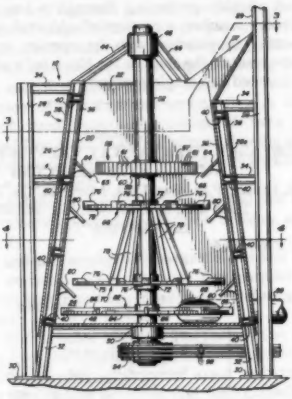
MULTI-PURPOSE CENTRIFUGAL MILL

Albert L. Burkett, 1451 E. Glenn, Tucson, Ariz. 85719

Filed Dec. 3, 1979, Ser. No. 99,524

Int. Cl.³ B02C *13/282*

U.S. Cl. 241—152 A **11 Claims**



1. A multi-purpose centrifugal mill for comminution of frangible materials comprising:

(a) a housing assembly having an upper end which defines a head section and a lower end which defines a bottom discharge section and having a vertical bore, said housing having a tangential output port in the bottom discharge section thereof;

(b) a materials input chute formed at the head section of said housing assembly and disposed tangentially of the bore thereof;

(c) grinding means in the head section of said housing assembly for receiving the frangible materials from said input chute and grinding those materials to an approximate predetermined size, said grinding means including,

I. a wheel rotatably journaled in said housing and having grinding teeth formed on the periphery thereof,

II. an endless shelf baffle having a central opening, said shelf baffle mounted in the bore of said housing concentric with said wheel,

III. said wheel and the concentric opening of said shelf baffle being sized to form an annular opening therebetween which determined the approximate size of the materials which may pass therethrough; and

(d) comminution means in the bore of said housing assembly below said grinding means for receiving the frangible materials therefrom and exerting comminution forces thereon.

4,493,460

APPARATUS FOR DEPOSITING A WEB OF MATERIAL ON A TABLE

Albert Buss, Munsingen, Fed. Rep. of Germany, assignor to G. O. Stumpf GmbH & Co. Kommanditgesellschaft, Reutlingen, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,232

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3114874

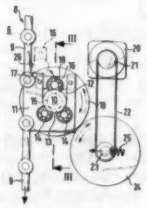
Int. Cl.³ B65H *19/06, 19/12, 35/04*

U.S. Cl. 242—58.6 **4 Claims**

1. Apparatus for allowing the untensioned unwinding off and laying out of a web from a bolt of material carried on a spindle, comprising:

a. a cutting table on which the untensioned web is to be deposited for a cutting operation thereon;

b. a magazine, positioned adjacent to said cutting table, for movably supporting a plurality of bolts of web for movement of any one bolt in the magazine into and out of a common unwinding position, said magazine comprising a pair of side endless drive elements, with each side drive element being formed by an endless series of articulated elements which support at intervals therealong suspension elements for supporting the ends of each bolt of material, supporting the spindle for movement of the bolt into and out of an unwinding position, each suspension element comprising a bracket, a recess in said bracket for receiving the spindle of the bolt, said recess having an open top and



a closed bottom, supporting means provided in the bottom of the recess for supporting the end of a bolt of material, said supporting means comprising two bearings which are spaced apart by a distance which is less than the diameter of the bolt spindle, a cross-piece releasably secured to the bracket to close the top of the recess, and retaining means mounted on the crosspiece;

c. locking means for locking the spindle in the unwinding position; and

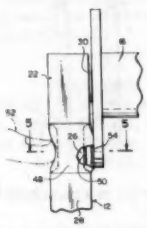
d. a common drive means, acting directly on the periphery of the bolt or on the spindle, when locked in said unwinding position, to rotate the bolt to unwind the web from the bolt.

4,493,461

KITE REEL

Jose R. Polanco, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jun. 10, 1983, Ser. No. 503,283
Int. Cl.³ B65H *75/40*
U.S. Cl. 242—96 **1 Claim**



1. A kite reel for controlling a line which comprises:

(a) a handle having a transverse aperture near top;

(b) an axle at one end within the aperture of the handle;

(c) a spool rotatably mounted onto the axle;

(d) means for rotating the spool about the axis of the axle as the line is wound and unwound from the spool; and

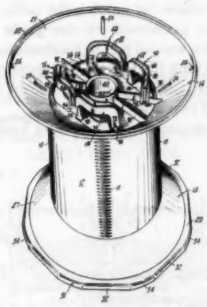
(e) means for stopping rotation of the spool about axis of the axle wherein said means comprises an elastic bag mounted around a reduced circumference of the handle near the spool so that when the elastic bag is pressed by a finger it will bulge out to bear against the spool.

4,493,462

SPOOL WITH LIFTING HANDLES

Louis G. Ditton, Ft. Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 18, 1984, Ser. No. 601,511
Int. Cl.³ B65H *75/40*
U.S. Cl. 242—118.61 **6 Claims**



1. A one-piece integrally molded plastic spool for the shipping, storage and handling of a substantial weight of metal wire comprising:

a substantially tubular barrel having a longitudinal axis;

an annular top end flange extending radially outwardly from one end of said barrel and an annular bottom end flange extending radially outwardly from the other end of said barrel to define with said barrel a space for wire wound about said barrel; said bottom end flange having a reinforced, substantially rigid portion for bearing the weight of wire wound about the barrel when said bottom end flange is seated upon a horizontal support surface;

an end plate located at said one end of the barrel and comprising a reinforced, substantially rigid disc extending radially inwardly from said one end of the barrel and having one side facing away from said barrel and an opposite inner side; and

first and second pairs of generally U-shaped finger-receiving handles formed integrally with said end plate and projecting axially outwardly from said one side of the end plate in diametrically opposed relationship around said longitudinal axis; said pairs of handles being substantially mirror images of each other through a plane coincident with said longitudinal axis and arranged to be engaged by right-hand and left-hand fingers, respectively, for two-handed lifting of the spool; said barrel being structurally interconnected with said end plate and said bottom end flange for transferring the weight of wire carried by the spool to said pairs of handles.

4,493,463

CABLE WINDING APPARATUS

Theodore Rivinius, 810 N. 2nd St. #9, Bismarck, N. Dak. 58501

Filed Jul. 25, 1983, Ser. No. 516,803
Int. Cl.³ B65H *54/28*
U.S. Cl. 242—158 F **12 Claims**

1. An apparatus for guiding a cable in a substantially uniform manner on a rotatable drum, the apparatus being mounted on a base proximate the drum and the drum having a central axis and first and second spaced apart ends, the apparatus comprising:

bearing means fixedly mounted to the base;

an elongated support slidably engaging the bearing means such that the elongated support is movable substantially parallel to the axis of a drum with which the apparatus is used in a transverse direction;

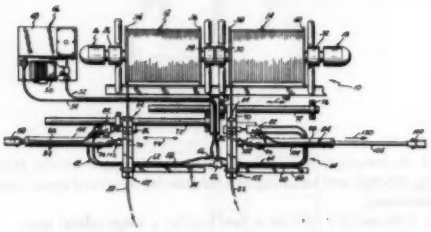
a guide support member having first and second ends, the

first end being disposed closer to such drum than the second end and the guide support member being fixedly attached to the elongated support proximate the first end;

first guide means for guiding a cable controlled by such drum, the first guide means being attached to the guide support member proximate the first end and being configured to permit the cable to move a limited distance in the transverse direction;

second guide means for guiding the cable, the second guide means being positioned on the guide support member proximate the second end in a substantially perpendicular relationship with the first guide means relative to the axis of such drum, the second guide means slidably engaging the cable on two sides;

hydraulic power means for providing hydraulic fluid;



actuator means fluidly connected to the hydraulic power means and having first and second ends with the first end being attached to the base and the second end being attached to the guide support member;

hydraulic valve means for directing the flow of hydraulic fluid from the power means to the actuator means; and

cable controlled means for actuating the hydraulic valve means movably mounted on the guide support member and normally engaging the cable extending from such drum, the means for actuating being operably connected to the hydraulic valve means such that transverse movement of the cable moves the means for actuating and activates the hydraulic valve means to direct flow to the actuator means so that the actuator means moves the guide support member in either a first or second transverse direction corresponding to the transverse movement of the cable.

4,493,464

PACKAGED STRAND

William A. Green, Swanton, Ohio; Joe E. Godfrey, and David S. Pietsch, both of Amarillo, Tex., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 19, 1983, Ser. No. 533,698

Int. Cl.³ B65H *55/02, 49/00;* B65D *85/671*

U.S. Cl. 242—170 **5 Claims**

1. A package comprising:

(a) an unwindable wound body of strand;

(b) a heat shrinkable, stretch membrane convolutely positioned about the wound body, said body and said membrane having been heated to place said membrane in conformance to the pluralities of undulations on said wound body, said body and said membrane having been heated to a temperature greater than the temperature at which said strand is thereafter unwound said temperature being in the range from about 110° F. to about 350° F.

4,493,465

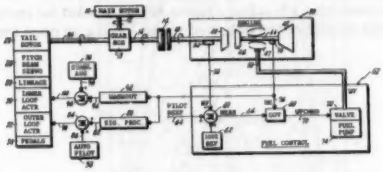
HELICOPTER ENGINE TORQUE COMPENSATOR

James J. Howlett, North Haven, and Raymond D. Zagranski, Somers, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,481

Int. Cl.³ B64C *27/78*

U.S. Cl. 244—17.13 **2 Claims**



1. An engine torque compensation for a helicopter including a free turbine engine (20) for driving the main (10) and tail (22) rotors, a closed loop fuel control (52) for maintaining the rotor speed constant by providing a fuel rate signal (WF) in response to an engine output shaft speed signal (NF) and a gas generator speed signal (NG), and a heading hold system for varying the tail rotor pitch to maintain yaw, characterized in that the heading hold system is responsive to the gas generator speed signal (NG) for providing engine torque compensation.

4,493,466

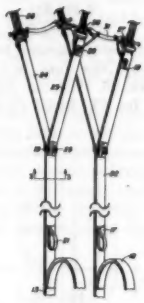
RISER

Bruce W. Trenholm, and James G. Woolley, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 410,285, Aug. 23, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 617,139

Int. Cl.³ B64D *17/34*

U.S. Cl. 244—152 **4 Claims**



1. A riser assembly for use in a parachute having a canopy, the assembly comprising:

an elongated riser having a predetermined end which is disposed toward the canopy when the parachute is deployed;

a lanyard extending along the riser from said end;

coupling link means terminating the riser at said end for attachment of a plurality of shroud lines thereto;

a connecting link terminating the lanyard for attachment of a control line thereto, said link being disposed, prior to deployment of the parachute, in a position alongside the riser and adjacent to said end, said link being substantially wider than the lanyard transversely of the riser; and

a sheath of elastic material extending along the riser oppositely of the lanyard and connected to the riser along a

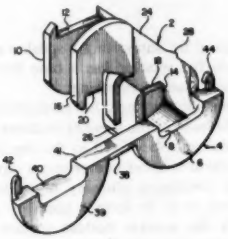
lateral edge thereof, the sheath terminating adjacent to said end and oppositely of said position therefrom, so that the sheath minimizes entanglement of the lanyard prior to deployment of the parachute and so that the sheath expands for passage of the connecting link when the lanyard is moved away from said end subsequent to such deployment.

4,493,467

STRAIN RELIEF

Jesus Borja, Chicago, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Mar. 25, 1982, Ser. No. 361,656
Int. Cl.³ F16L *5/00*
U.S. Cl. 248—56 2 Claims



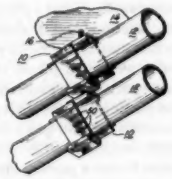
1. A one-piece plastic strain relief bushing for a power cord line comprising a longitudinally extending main body portion having a first end wall with a cord receiving notch at one end and having an end section at the other end including a second end wall with a cord receiving notch, a pair of spaced intermediate walls being integrally formed on said main body portion between said first and second end walls in parallel relation thereto, said intermediate walls each having a cord receiving edge that is disposed relative to said cord-receiving notches of said end walls in a manner that the cord-receiving edge portions of said notches and the cord-receiving edges of said intermediate walls cooperate with said first and second end walls to define a serpentine path for receiving a power line cord in a manner to impart an abrupt bend in the cord, said end section further including a locking portion hingedly connected to said second end wall adjacent to said cord-receiving notch for displacement between opened and closed positions, said locking portion having an edge portion which overlies said second cord-receiving notch when in said closed position to thereby define an opening through which said cord is positionable, and fastening means for selectively retaining said locking portion in said closed position.

4,493,468

ADJUSTABLE PIPE FASTENER

Thomas C. Roach, 5756 N. Fail Rd., LaPorte, Ind. 46350

Filed Jul. 5, 1983, Ser. No. 510,727
Int. Cl.³ F16L *3/10*
U.S. Cl. 248—62 12 Claims



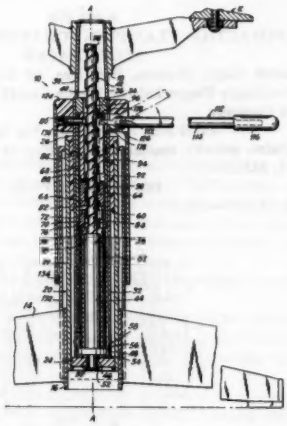
1. A pipe fastener for hanging or otherwise supporting pipe installations, comprising a top member having sides extending outwardly and disposed at substantially right angles to one another, a bottom member having sides extending outwardly and disposed at substantially right angles to one another, said top and bottom members being interconnected and forming an enclosure for receiving a pipe, an adjustment means for changing the size of said enclosure including a plurality of spaced parallel slots disposed in said first and second mentioned sides and extending inwardly at substantially right angles from one edge of said sides, and a means for securing said pipe within said enclosure.

4,493,469

HEIGHT ADJUSTMENT CONTROL ARRANGEMENT

Raymond E. Holobaugh, Tupelo, Miss., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Jan. 19, 1983, Ser. No. 459,044
Int. Cl.³ F16M *11/00*
U.S. Cl. 248—406.1 20 Claims



1. A displacement adjustment control arrangement, comprising:

(a) a first mounting means, and a second mounting means displaceable in either direction along a longitudinal axis relative to the first mounting means in response to manual longitudinal displacement of the first and the second mounting means towards and away from each other; and

(b) user-operated adjusting means operatively connected to the first and the second mounting means for manually adjusting the extent of the longitudinal displacement, including

(1) a longitudinally-extending member having engaging portions,

(2) an adjustment member having complementary engaging portions which engage the engaging portions and mount the adjustment member on the longitudinally-extending member for movement along the same in response to the longitudinal displacement,

(3) keeper means movable between a locked position in which the keeper means lockingly engages the adjustment member and secures the same at one secured position on the longitudinally-extending member to thereby prevent the longitudinal displacement, and a released position in which the keeper means is disengaged from locking engagement with the adjustment member and enables the longitudinal displacement to move the adjustment member relative to the longitudinally-extending member to another secured position thereon that is spaced longitudinally from the one secured position,

(4) single stroke, manually-actuatable release means in force-transmitting relationship with the keeper means for manually moving the same in a single motion from the locked position to the released position, said release means including a handle means located within easy reach of a user, and

(5) keeper restoring means operatively connected to the keeper means for moving the same from the released position to another locked position in which the keeper means lockingly engages the adjustment member and secures the same at said other secured position on the longitudinally-extending member,

whereby the user may manually adjust the extent of the longitudinal displacement to any desired amount.

4,493,470

RAPID ACTION CLAMPING FOR COOPERATION WITH SLOT TRACKS

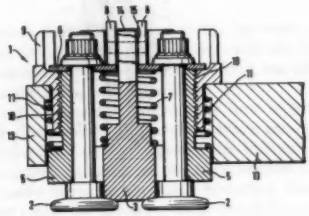
Hinrich Engel, Bremen, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 521,458

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232234

Int. Cl.³ A47B *97/00*

U.S. Cl. 248—503.1 **4 Claims**



1. Rapid action clamping element for positioning and locking components in relation to a slot track comprising:

a latch housing being one of the components;

a base element resiliently held in and biased for engagement with the latch housing and having an external annular threading and provided for mounting two mushroom headed posts projecting in an aligned relationship from below the base element;

a cylindrical post disposed in between the two mushroom headed posts, the cylindrical post being spring biased;

a plate held against the base element on a side opposite the side from which the mushroom heads of the mushroom headed posts project, said two mushroom headed posts being secured to said plate, said plate having an opening through which an end of the cylindrical post projects;

a crown ring threaded upon said base element and having shoulder means provided for being positioned with respect to said latch housing so that the extent of threading the crown ring upon the base element determines the extent to which said mushroom headed posts project from said latch housing; and

handle means connected to said end of said cylindrical post and having two operating positions wherein in one operating position said cylindrical post is retracted while in the other position the cylindrical post is protracted, and the handle means rests in between the prongs of the crown ring for preventing said crown ring from turning.

4,493,471

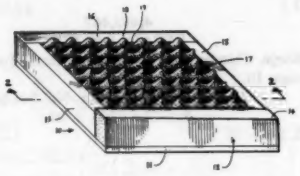
SOUND SPEAKER STAND FOR ATTENUATING VIBRATIONS

Donald E. McInnis, 1611 Elwood Dr., Los Gatos, Calif. 95030

Filed Feb. 14, 1983, Ser. No. 466,059

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—580 **6 Claims**



1. A speaker stand for supporting a speaker enclosure on a floor and wherein the speaker has a base forming a planar bottom surface, said stand comprising:

a rigid planar member having a top surface of sufficient size to support the base of the speaker enclosure;

a waffled cushion member fixed to the top surface of said base, said cushion member comprising a top layer of resilient material forming a plurality of peaks and valleys facing upward so as to form a plurality of closed, air pockets with the speaker bottom surface to attenuate vibratory motion transmitted therebetween, a plurality of resilient members of less resiliency than said cushion member supported to the opposite sides of said cushion member to support and stabilize said speaker enclosure while preventing the leveling of said peaks with the valleys of the cushion member.

4,493,472

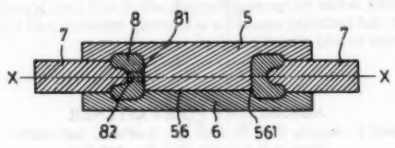
MOULD USED FOR MAKING A RACKET FRAME

Kun N. Lo, No. 7-1, La. 246, Chung Hsan Rd., Sec. 3, Tan Tzu Hsiang, Taiwan

Filed Sep. 9, 1982, Ser. No. 416,401

Int. Cl.³ B29C *1/06, 1/14*

U.S. Cl. 249—57 **2 Claims**



1. A racket frame mold for a racket frame having a looped head of generally U-shaped cross-section and round edges, upper, lower, inner and outer surfaces and a plurality of stringing holes therein; a throat section; and a shaft section, the racket frame mold comprising: an upper mold piece; a lower mold piece, the upper and lower mold pieces cooperating to form a space defining the upper, lower and inner surfaces of the looped head, the throat portion and the shaft portion of the racket frame; and an intermediate mold piece interjacent the upper and lower mold pieces for defining the outer surfaces of the looped head of the racket frame; a parting line between the upper and lower mold pieces being located intermediate the lower side of the stringing hole and the lower surface of the looped head of the racket frame.

4,493,473

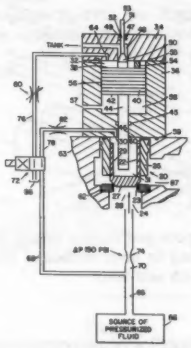
VALVE ARRANGEMENT

Felix Rexer, 109 Lille Rd., Nashua, N.H. 03062

Division of Ser. No. 284,477, Jul. 17, 1981,. This application Jan. 9, 1984, Ser. No. 569,236

Int. Cl.³ F16K *31/124*

U.S. Cl. 251—63.4 5 Claims



1. A poppet valve arrangement comprising:

a poppet valve having a first end wall and a first inlet fluid passageway and a second outlet fluid passageway;

said valve comprising a valving chamber, a poppet mounted in said valving chamber for movement between two extreme positions respectively toward, and away from, said first end wall for respectively opening and closing communication between said fluid passageways, said poppet having a predetermined cross-sectional working area exposed in said valving chamber;

positioning means for controlling the position of said poppet element between its extreme positions to control the volume of fluid flow between said passageways and comprising;

a. a piston having inner and outer faces each on an opposite side thereof;

b. a cylindrical wall receiving the piston in fluid sealed relation for forward and backward motion;

c. an outer end wall, an inner end wall, said outer end wall, said cylindrical wall, and one of said end faces defining a piston chamber, said piston chamber having an outlet port of predetermined area and an inlet port;

d. a spear carried by said piston and extending from said outer piston face, said spear having a portion with an area of its cross section transverse to the piston motion which diminishes with distance from said outer face, so that as said piston moves toward or away from said outer end wall, said portion correspondingly advances into and withdraws from said outlet port and the area of said outlet port available for fluid passage is correspondingly diminished or enlarged;

e. a pin controlled by said piston, normally spaced from said poppet, and fluid sealed from the piston chamber for exerting force on said poppet away from said first end wall, and;

f. means for applying fluid pressure selectively to a passageway of said poppet valve to apply pressure on said poppet.

4,493,474

ELECTROMAGNETIC VALVE UNIT

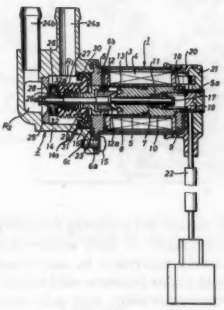
Tadashi Ohyama, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 20, 1982, Ser. No. 370,269

Claims priority, application Japan, Apr. 22, 1981, 56-58340[U]

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—129 9 Claims



1. An electromagnetic valve unit including a flow control valve assembly for controlling the flow of fluid passing therethrough and operatively associated with an electromagnetic motor assembly for actuating said valve assembly in response to an electric current applied thereto from an electric control circuit, said motor assembly comprising:

a motor housing of magnetic material providing at one end thereof with a fitting face;

a solenoid coil concentrically assembled within said motor housing and connected to said electric control circuit;

a stationary core of magnetic material surrounded by said solenoid coil;

a yoke member of magnetic material fitted at its outer periphery to the fitting face of said motor housing and having a stepped portion arranged to be coaxial with said stationary core;

a shaft of non-magnetic material extending through the axes of said stationary core and said yoke member into said valve assembly;

first and second bearing means for axially slidably supporting said shaft, respectively, from said stationary core and said yoke member;

a movable core of magnetic material fixed to said shaft to be axially moved between said stationary core and said yoke member, said stationary core and said movable core having first and second confronting end faces;

a sleeve member of non-magnetic material surrounded by said solenoid coil and having positioned therewithin said stationary core and the stepped portion of said yoke member for alignment of said first and second bearing means;

resilient means for loading said shaft toward said valve assembly;

said valve assembly comprising:

a valve housing secured to said motor housing through the outer periphery of said yoke member and being provided with first and second ports;

a valve seat member assembled within said valve housing to subdivide the interior of said valve housing into first and second chambers, respectively, in open communication with said first and second ports, said valve seat member being in surrounding relationship with said shaft; and

a valve element fixed to said shaft to cooperate with said valve seat member to control the flow of fluid between said first and second chambers in response to axial movement of said shaft wherein said valve assembly further comprises bellows means interposed in a fluid-tight man-

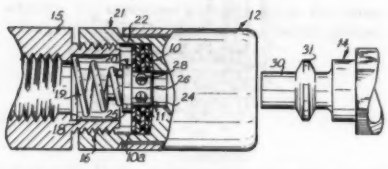
ner between said yoke member and said shaft for preventing the flow of fluid from the interior of said valve housing into said motor assembly.

4,493,475

SEAL FOR QUICK DISCONNECT COUPLING

David M. Baird, 4285 Smithsonia Dr., Tucker, Ga. 30084

Filed Aug. 22, 1983, Ser. No. 525,155
Int. Cl.³ F16K 51/00
U.S. Cl. 251—149.1 3 Claims



1. In a quick disconnect coupling including a female member connected to a source of fluid under pressure, and a male member selectively receivable in said female member for receiving said fluid under pressure, said female member having a first bore in communication with said source of fluid under pressure, a second bore concentric with said first bore, a valve member in said first bore selectively movable to a first position wherein said valve member seals said first bore with respect to said second bore and to a second position, said male member including a valve operating member having a bore therethrough, said valve operating member being receivable within said second bore of said female member for urging said valve member to said second position wherein said valve member allows communication of said first bore with said bore through said valve operating member, the combination therewith of a seal comprising a plurality of washers, each washer of said plurality of washers having an outer periphery engaging the wall of said first bore and a central hole concentric with said second bore, said central hole in said washer being sized to receive said valve member when said valve member is in said first position, said central hole further being sized to receive said valve operating member of said male member and effect a fluid seal, the total thickness of said plurality of washers being sufficient to allow said valve operating member to move said valve member to said second position, each of said washers being formed of a plastic material.

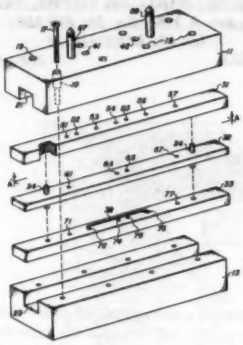
4,493,476

SLIDE VALVE FOR CONTROLLING FLUID FLOW

Reid A. Strickland, and Timothy J. Roller, both of 689 Ogden Parma Town Line Rd, Spencerport, N.Y. 14559

Filed Sep. 28, 1982, Ser. No. 425,897
Int. Cl.³ F16K 11/06, 3/314
U.S. Cl. 251—176 7 Claims

1. A slide valve for controlling fluid flow, comprising a body having two surfaces spaced from and parallel to each other, each of said surfaces having at least one port opening in such surface, a slide assembly slidable longitudinally in the space between said two parallel surfaces, said slide assembly being formed of at least two members overlying each other, one member of the assembly sliding along and being tightly engaged with one of said two parallel surfaces, another member of the assembly sliding along and being tightly engaged with the other of said two parallel surfaces, one member of the slide assembly being resilient and being compressed in a direction perpendicular to said two parallel surfaces so that the resilience thereof tends to hold the slide assembly tightly engaged with said two parallel surfaces of said body, and porting means in said members of said slide assembly for forming a connecting passage from a port in one of said surfaces to a port in the other of said surfaces when said slide assembly is in a predetermined longitudinal position in said body, said porting means including at least two ports extending through the thickness of one member of the slide assembly, and a channel forming a passageway



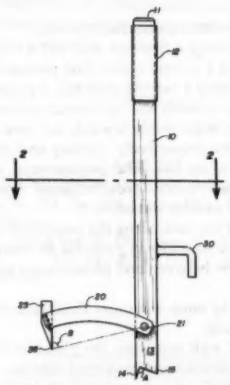
between one of said ports and another of said ports, said channel being formed along an inner surface of said one member and out of contact with said body.

4,493,477

CARPENTERS TOOL

Robert E. Greer, R.D. #3, Glen Rock, Pa. 17327

Filed Aug. 29, 1983, Ser. No. 527,268
Int. Cl.³ B66F 3/00
U.S. Cl. 254—15 5 Claims



1. A carpenter's tool for use in construction of wood-framed structures comprising:

(a) an elongated handle of rectangular transverse cross section having one end sharpened to form first and second wedges, each wedge having converging flat inner and outer faces, one side of the handle constituting the outer face of the first wedge, the side of the handle opposite said one side constituting the outer face of the second wedge, the angle between the faces of the first wedge being from about 18 degrees to about 25 degrees;

(b) a bar extending from said one side of the handle and pivoted to the handle adjacent the sharpened end for pivoting about a pivot axis perpendicular to the longitudinal axis of the handle; and

(c) a sharpened member at the outer extremity of the bar and generally at a right angle thereto, the tip of the member extending in the direction of the sharpened end of the handle,

the distance from the pivot axis to the tip of the sharpened

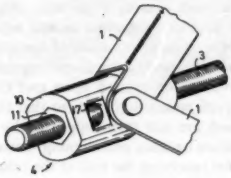
member being (i) about one to about three times the distance from said axis to the tip of the first wedge and (ii) about three to about six times the distance from the tip of the sharpened member to the bar.

4,493,478

JACK

Walter Fortgens, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 30, 1982, Ser. No. 445,833
Claims priority, application Sweden, Dec. 8, 1981, 8107336
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—126 **7 Claims**



1. Jack, comprising an externally threaded rod and an internally threaded nut member engaging the threads of the rod, the displacement of the member along the rod as the rod is rotated relative to the nut member extending or retracting the jack, characterized in that the nut member consists of a threaded load-carrying main portion and a threaded axially unloaded portion separate therefrom, the thread of said axially unloaded portion being disposed after the thread of the main portion, as viewed when the nut member is moved relative to the rod to extend the jack, and that said main and unloaded nut portions have, firstly, interacting surfaces which during normal thread engagement between the main portion and the rod prevent rotation of said main and unloaded portions relative to each other but which permit axial relative movement between said main and unloaded portions, and secondly, axial stop surfaces facing each other, which during normal thread engagement are spaced axially from each other, said main and unloaded portions of the nut member being so arranged that said surfaces preventing relative rotation are out of contact with each other when the stop surfaces are in contact.

4,493,479

HOIST DRIVE SAFETY SYSTEM

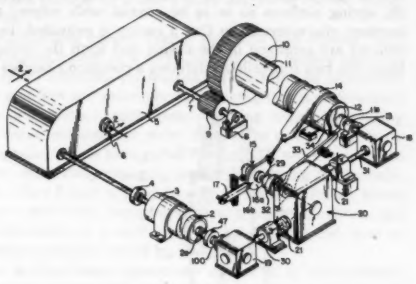
Charles W. Clark, Seattle, Wash., assignor to Ederer Incorporated, Seattle, Wash.

Continuation of Ser. No. 205,009, Nov. 7, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 475,684
Int. Cl.³ B66D *1/48*; B66B *1/26*
U.S. Cl. 254—274 **29 Claims**

13. A safety system in a hoist having a reversible electric input motor, a primary drive train including a gear reduction unit drivingly connected to the input motor, a drum drivingly connected to the gear reduction unit, and an emergency brake operatively coupled to the drum, comprising:

a mechanical out-of-sync detector having an output member and first and second input members, means coupling the first input member to the primary drive train, and means coupling the second input member to the drum, said reversible input motor causing each of said input members to rotate multidirectionally and simultaneously in all normal raising and lowering operating modes of said hoist, said output member moving upon an out-of-sync condition between said input members; and

a spring-set brake including spring means for setting the brake, mechanical trigger means for holding the brake against the brake-setting force of the spring means and releasing the spring means for setting the brake responsive to said motion of the output member, and mechanical link means coupled to the output member so that upon said movement of the output member of the detector, the



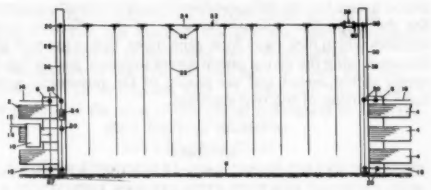
motion is transmitted via the mechanical link means to release the trigger means and allow the spring to set the brake.

4,493,480

ELECTRIFIED FENCE GATE

Bud Nichol, Box 188 - Star Rte., Winona, Mo. 65588

Filed Sep. 14, 1983, Ser. No. 531,865
Int. Cl.³ A01K *3/00*
U.S. Cl. 256—10 **2 Claims**



1. An electrified fence gate comprising:

a. a single flexible electrically conductive support wire extending generally horizontally and spanning a gate opening of a fence above ground level, said support wire being secured at its ends to elements of said fence but being otherwise unsupported,

b. a series of flexible, electrically conductive gate wires each connected at its upper end to said support wire by means operable to permit free universal pivotal movement of the former relative to the latter, and additionally operable to permit swivelling of said gate wire about its own axis relative to said support wire.

4,493,481

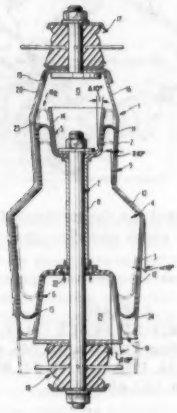
PNEUMATIC SPRING FOR MOTOR VEHICLES

Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,599
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 2750667
Int. Cl.³ B60G *11/26*; F16F *3/00, 9/04*
U.S. Cl. 267—64.27 **23 Claims**

1. A pneumatic spring for motor vehicles which includes

two supports, at least one closed spring volume, two spring surfaces of different sizes which are adapted to be subjected to pressure in opposite directions, the two spring surfaces each having an effective spring surface which is variable as a function of road clearance of the vehicle, and means for supporting the spring surfaces so as to be coaxial with respect to one another, characterized in that a casing is provided, two roll bellows are arranged in the casing and form the spring surfaces, the two roll bellows defining a common chamber forming at least a portion of the spring volume of the pneumatic spring, the supporting means includes a pair of spring piston means associated with the respective roll bellows, the spring piston means having different diameters and providing support for the respective bellows on sides of the effective spring surfaces which face away from each other, means are provided for connecting the spring piston means together, and in that the spring piston means and the casing of the pneumatic spring form a portion of the two supports.

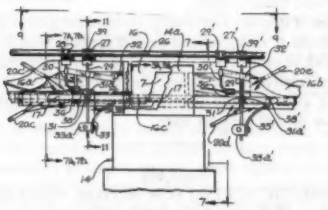


4,493,482

MOTION STABILIZING AND ALIGNING APPARATUS FOR MOVING FOLDED SIGNATURES THROUGH AN INK JET PRINTER

Edward R. Valenti, Oak Park; Thomas J. Adamczyk, Mount Prospect, and Larry W. Graham, Schaumburg, all of Ill., assignors to Alden Press, Inc., Elk Grove Village, Ill.

Filed Sep. 27, 1983, Ser. No. 536,289
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—12 **16 Claims**



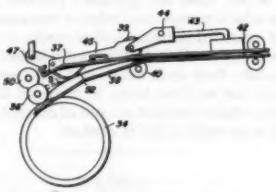
1. In a booklet-making system including a collating conveyor means having an inverted V-shaped top profile for receiving folded signatures to be draped thereover, said conveyor extending over a given path passing by spaced signature feeding stations having signature feeding means for sequentially draping and stacking folded signatures over longitudinally spaced points of the conveyor means, with the crotch of the fold of each signature resting on the apex of the conveyor means so as to form booklet-forming signature stacks having panels on opposite sides of their folds extending generally vertically downwardly therefrom, said conveyor means having horizontally projecting signature stack positioning and pushing means for engaging the trailing edges of the signature stacks draped on the conveyor means for positioning and aligning the same therealong, and a printing station where an ink jet printing means is to be located by said conveyor means following one of said signature feeding stations for projecting ink jets in selectively controlled patterns in synchronized relation with the speed of movement of the conveyor means to print customized information on the exposed face of a signature draped on said conveyor means, the improvement wherein there is provided signature raising means in the path of movement of the signature or stack of signatures to and past said printing station for raising the draped signature or stack of signatures involved to be printed upon and the fold thereof above the conveyor means involved, so that the signature or stack of signatures are not then supported by the conveyor means, and signature backing and aligning means opposite said printing station for receiving the fold of the raised signature or stack of signatures, and for acting as a backing support therefor to stabilize and align the same as it moves past said printing station.

4,493,483

INVERTER-REVERSER FOR A REPRODUCTION MACHINE

Roger G. Teumer, Fairport, and David M. Attridge, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 31, 1979, Ser. No. 7,862
Int. Cl.³ B65H *29/00*
U.S. Cl. 271—186 **1 Claim**



1. In a sheet handling apparatus for a reproduction apparatus arranged for two-sided copying having an arrangement for inverting a sheet to prepare the same for receiving an image on a second side thereof wherein the arrangement includes first and second feed rolls forming a first feed roll pair having a nip for moving a sheet in one direction and a third feed roll forming a second feed roll pair with the second roll having a nip for moving a sheet in the opposite direction, and a resilient stop means against which a sheet moving in said one direction contacts to deflect the same and effect the edge of the sheet opposite the stop means to be engaged by the second roll and be directed into the nip of the second feed roll pair, the improvement comprising:

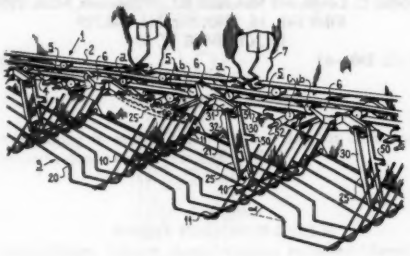
means movable into and out of the path of movement of a sheet of paper as the same is guided toward the second feed roll pair for controlling formation of a buckle on the sheet between said movable means and the stop means as the edge of the sheet opposite the stop means is carried around the second roll and into the feed nip of the secod roll pair, said movable means is weighted to form a relatively large buckle for very lightweight sheets and to form a very shallow buckle for sheets of heavyweight paper.

4,493,484

DEVICE FOR GUIDING AND RECEIVING LETTERS AT THE EXIT OF A MAIL-SORTING MACHINE AND A MACHINE EQUIPPED WITH SAID DEVICE

Jean Eyer, Paris, France, assignor to Hotchkiss-Brandt-Sogeme-H.B.S., Paris, France

Filed Sep. 29, 1982, Ser. No. 428,333
Claims priority, application France, Oct. 9, 1981, 81 19080
Int. Cl.³ B65H *31/26, 29/68*
U.S. Cl. 271—220 **10 Claims**



1. A device for guiding and receiving letters at an exit of a mail-sorting machine, comprising:

a system for conveying letters in cooperating relation with at least one receiving compartment, wherein each compartment is designed in the form of a basket;

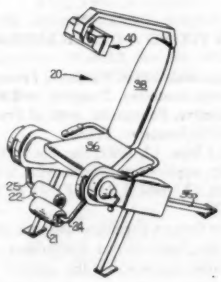
a pendulum articulated about an axis, said pendulum being positioned relative to said conveying system and basket such that said pendulum brakes and guides said letters towards the bottom of the selected basket in order to form a stack as soon as said letters pass out of said conveying system, said axis of articulation of each said pendulum being coupled with a flap having the function of deviating the letters discharged from said conveying system, wherein each said pendulum is constituted by a rigid arm terminating in a small tongue of flexible material and having a right-angled lug which cooperates with a proximity detector when the corresponding basket is full, wherein said device includes a locking system assigned to each basket and capable of stationarily maintaining the corresponding pendulum in a rest position.

4,493,485

EXERCISING APPARATUS AND METHOD

Arthur A. Jones, Lake Helen, Fla., assignor to Nautilus Sports/-Medical Industries, Inc., Lake Helen, Fla.

Continuation of Ser. No. 229,922, Jan. 30, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 495,575
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—126 **18 Claims**



1. Exercise apparatus for providing a user with a range of exercise movements and recording a measure of the effort exerted, said apparatus including:

first body engaging means adapted to be contacted by a first portion of a user's body and to be moved therewith;

second body engaging means adapted to be contacted by a second portion of a user's body and to be moved therewith;

interconnecting means linking said first and second body engaging means in a force transmitting passive relationship for effecting predetermined coordinated movement of said first and second body engaging means with respect to one another, said interconnecting means converting positive musculature work applied to one of said body engaging means to negative musculature work supplied to said other body engaging means, there being substantially no other forces applied to and no resistive forces acting upon said body engaging means, whereby all forces and resistances are provided solely by the user and may be instantaneously varied by said user;

force sensing means operatively connected to said interconnecting means and producing an output signal proportional to the magnitude of the force applied to at least one of said body engaging means;

position sensing means operatively connected to said interconnecting means and producing an output signal proportional to the position of at least one of said body engaging means;

processing means responsive to said force sensing means and said position sensing means to provide an output signal proportional to the physical effort exerted by the user as represented by the applied forces and changes of position; and

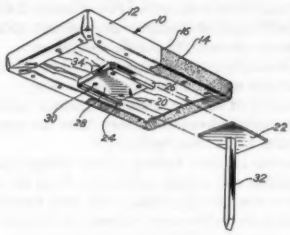
display means responsive to said processing means output signal to generate a cognizable display.

4,493,486

BALL BASE CONSTRUCTION AND ANCHOR

Charles C. Fuller, and James L. Hendrickson, both of Washington, Ill., assignors to Safe-Base, Inc., Washington, Ill.

Continuation of Ser. No. 242,160, Mar. 9, 1981, Pat. No. 4,398,714. This application Mar. 17, 1983, Ser. No. 476,048
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ A63B *71/02*
U.S. Cl. 273—25 **1 Claim**



1. An improved ball base comprising, in combination:

a unitary base pad member having a rectangular shape and divided into only two substantially square equal sized subsections when viewed in a top plan view, the pad member further comprising a pad support and a pad cover, each of said subsections including visually distinctive and different coloring of the covering of each subsection, each subsection being substantially monochromatic; each subsection being substantially equal to the regulation size of a base pad, the subsections being integrally formed in a single rectangular pad with a single straight line having no lateral dimension demarking one subsection from

the other, each subsection having substantially the same thickness; and

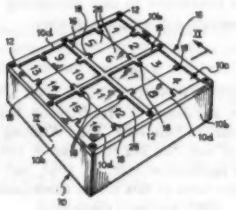
means for attaching the pad member to the ground to retain one subsection inside an imaginary line defined as the foul line and the other subsection simultaneously outside said line with the straight line demarking the subsections, being positioned coincident with the foul line, said means for attaching comprising cooperative means attached to the bottom center of the base, a rod means which projects into the ground, and means for slidably securing the rod means to the cooperative means whereby the rod means and the cooperative means slide relative to each other in a direction transverse to the straight line demarking the subsections, said means for attaching also defining means for preventing the straight line from becoming unaligned with the foul line by shifting the straight line to the outside of the foul line or twisting the straight line relative to the foul line, and including pad holding means engaging the pad and holding the pad rigidly with respect to the ground, whereby a runner may tag the outside subsection and a baseman can tag the inside subsection and the pad will remain substantially rigidly positioned.

4,493,487

INTERCHANGEABLE TILES PUZZLE

Donato Ferrigni, Via Giacosa 16, Settimo Torinese, Italy

Filed May 6, 1983, Ser. No. 492,330
Claims priority, application Italy, May 6, 1982, 53260/82[U]
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **2 Claims**



2. Puzzle of the type in which a plurality of members provided with identification means are moveable along predetermined paths from a disordered configuration into a configuration which is predetermined in dependence upon the identification means, wherein the puzzle comprises:

a substantially parallelepiped shaped box having a base wall and side walls bounding an open face;

a plurality of support elements housed within the box and moveable individually away from the open face perpendicular to the base wall;

respective resilient biasing means acting upon the support elements and urging them away from the base wall;

at least one tile provided with said identification means resting on each support element on that side thereof facing the open face of the box, and parallel thereto, and

stop means carried by the box for retaining the tiles against the action of the said resilient biasing means, so that the uppermost tiles are disposed in correspondence with the open face of the box, while the resilient biasing means allow each tile to be moved into correspondence with the support element of one of the adjacent tiles when said support element is pressed towards the base wall of the box;

wherein the open face of the box is rectangular and the box contains a single row of support elements and respective tiles; and

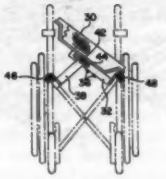
wherein the stop means comprise a frame attached to the edge of the side walls of the box and having two major sides projecting into the open face of the box to retain the tiles.

4,493,488

PRESSURE CONTROL WHEEL CHAIR SEAT

David J. Panaia, 36 Hunt Seat Dr., Chicopee, Mass. 01020, and Walter C. Lovell, 348 Mountain Rd., Wilbraham, Mass. 01095

Filed Feb. 16, 1982, Ser. No. 348,719
Int. Cl.³ B62B 11/00
U.S. Cl. 280—42 **9 Claims**



1. A folding wheel chair including wheels, folding cross frames between the wheels of the chair, and tubular side frame members forming parts of the cross frames, a rigid wheel chair seat comprising a single rigid support having a flat bottom member and raised side edges, said cross frames being in a plane at right angles to the wheels, said flat bottom member having an underside,

first structural members attached to the underside of said flat bottom member, said first structural members having end portions,

second structural members having end portions, connection means for pivotally and slidably connecting said second frame members to said first frame members near the center of said support, said connection means including a pin in each of said second structural members for engaging a slot in each of said first structural members, and means located at the outer end portions of said first and second structural members for pivotably and releasably securing said structural members to said tubular side frame members,

wherein said structural members pivot about said connection while said outer end portions remain secured to said tubular side frame members when said seat is pivoted from a horizontal seating position to a vertical folded position in which said seat is generally parallel with and between the wheels of the wheel chair.

4,493,489

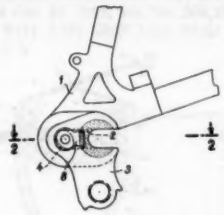
DEVICE FOR FIXING A DERAILLEUR ON A FRAME LUG

Roger Huret, deceased, late of Nanterre, France; by Alain P. B. Huret, legal representative, Bougival, and by Gerard Huret, legal representative, Fourqueux, both of France, assignors to Huret et ses Fils, Nanterre, France

Filed Mar. 17, 1982, Ser. No. 359,124
Claims priority, application France, Mar. 23, 1981, 81 05719
Int. Cl.³ B62M 9/06; F16H 11/00
U.S. Cl. 280—238 **10 Claims**

1. A device for fixing a derailleur support on a bicycle frame lug defining a slot, said device comprising wedging means which are rotatably mounted on the support with a high degree of friction between the support and the wedging means for cooperation with the frame lug for holding the support on

the lug by a wedging effect on the frame lug, and an elastically yieldable means which is carried by the support and is capable



of engaging in said slot of the frame lug for centering the support relative to the frame lug.

4,493,490

FRONT FORK FOR CYCLE

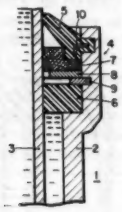
Toshio Ohma, Fukuroi, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1982, Ser. No. 433,710

Claims priority, application Japan, Dec. 28, 1981, 56-198917[U]

Int. Cl.³ B62K *25/06*

U.S. Cl. 280—276 **6 Claims**



1. A front fork for a cycle, including an inner cylinder fitted slidably in an outer cylinder with a dust seal and an oil seal forming a sliding fit with the outer circumference of the inner cylinder and fitted in the head portion of the outer cylinder and also including a lubricating device in the form of a guide interposed between the dust seal and the oil seal so as to slide on the outer circumference of the inner cylinder and impregnated with a lubricant.

4,493,491

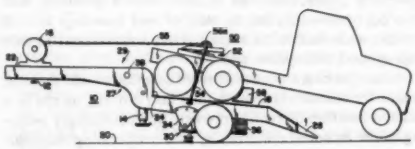
APPARATUS FOR TRANSPORTING TRUCK TRACTORS AND TRUCK UNITS

Richard L. Karlik, Morganville, N.J., assignor to Nappi Trucking Corp., Matawan, N.J.

Filed Mar. 10, 1983, Ser. No. 474,015

Int. Cl.³ B62D *53/04*

U.S. Cl. 280—402 **6 Claims**



1. Apparatus operative in conjunction with a truck tractor having a 5th wheel and a compressed air-braking system, for transporting about heavy duty truck, automotive, and like wheeled equipments, comprising:

a trailer having a platform portion a predetermined distance above a roadway, a downwardly sloping bed portion a lesser distance above said roadway and of a length to support the front or rear wheels of the truck, automotive and like equipment to be transported about, a substantially vertical wall section joining said platform and downwardly sloping bed portions, and a further downwardly sloping ramp portion connected to said bed portion and movable with respect thereto;

kingpin means cooperating with the platform portion of said trailer for coupling to the 5th wheel of said truck tractor in moving said trailer about on said roadway;

expandable air bag means interactively coupled between said trailer and the compressed air-braking system of said truck tractor, and controllably actuable with the compressed air therefrom to a first position to lower the height of said sloping bed portion and said sloping ramp portion with respect to said roadway so as to permit the loading and unloading of said front or rear wheels onto and from said downwardly sloping bed portion of said trailer, and controllably actuable to a second position to raise the height of said sloping bed portion and said sloping ramp portion with respect to said roadway so as to permit the moving about of said trailer on said roadway;

securement means interactively coupled between said trailer and the truck, automotive, and like wheeled equipments to be transported about for holding said equipments securely in place during the transportation thereof; and

winch means provided atop the platform portion of said trailer for assisting in the loading and unloading of said front or rear wheels onto and from said downwardly sloping bed portion of said trailer; and

wherein said winch means is of a construction sufficient to load said front or rear wheels of said truck, automotive, and like wheeled equipments a distance along said sloping bed portion so as to bear said front or rear wheels against the substantially vertical wall section of said trailer for further holding said truck, automotive, and like wheeled equipments in place during their transportation about.

4,493,492

FOLDABLE MULTI-FUNCTIONAL CARRIAGE

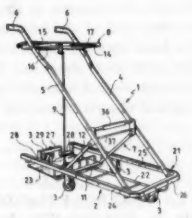
Tzvetanka Balabanova, 15 Rue du Parc Montsouris, 75014 Paris, France

Filed Mar. 23, 1982, Ser. No. 360,992

Claims priority, application France, Mar. 27, 1981, 81 06245

Int. Cl.³ B62B *3/02*

U.S. Cl. 280—651 **18 Claims**



1. A multi-functional carriage, particularly for use in performing cleaning and maintenance tasks in hospitals, said carriage comprising a rigid chassis having stop means, rollers supporting said rigid chassis and a foldable framework mounted on said rigid chassis so as to be foldable between an operative, unfolded position and an inoperative, folded position, said framework having at least two arms pivotally mounted on said chassis, and a strut frame pivotally mounted between said two arms so as to form a strut adapted to abut

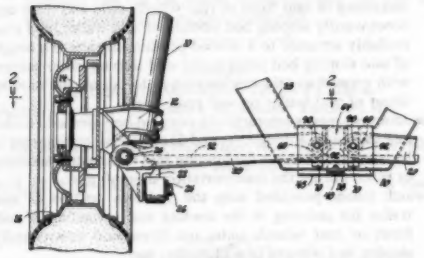
against said stop means to maintain said framework in its unfolded position, said two arms carrying therebetween support means for carrying articles or utensils on said carriage, said support means including at least wringer support means for supporting a removable, manually-operated wringing machine, said wringer support means being fixedly connected to said two arms adjacent the pivot points of said strut frame thereon.

4,493,493

ALIGNMENT ADJUSTMENT APPARATUS FOR VEHICLE WHEEL SUSPENSION

Terry L. Satchell, Rochester, and Robert E. Custance, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 18, 1982, Ser. No. 434,901
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **3 Claims**



1. In wheel suspension for an automotive vehicle including a wheel carrier and a link extending for pivotal interconnection at one end thereof to support structure at a selected location on the vehicle chassis and at the other end thereof to the wheel carrier to control displacement of the latter relative the vehicle chassis, alignment adjustment mounting apparatus comprising bracket means affixed to the chassis support structure including opposed vertical walls having aligned generally horizontally extending slots adapted for reception therewithin of a fastener bolt, a connector element affixed to said one end of the control link centrally bored and received between said walls in axial alignment with said slots, a generally vertically oriented adjustment lever including intermediate its ends a bore axially aligned with said connector element, bolt fastener means extending through said connector element, said slots and said aligned bore of the adjustment lever, means on said support structure cooperating with one end of said adjustment lever to provide a fulcrum for rotation of the latter thereabout, and means at the other end of the adjustment lever adapted for reception of a hand tool for application of manual force to swing the adjustment lever about said fulcrum to bodily longitudinally carry said control link and in turn the wheel carrier relative the vehicle chassis to various wheel alignment positions.

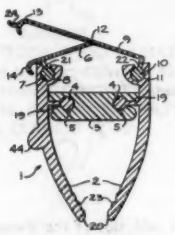
4,493,494

SKI POLE HANDLE

John A. Feagin, Jr., P.O. Box 2770, Jackson, Wyo. 83001

Filed Jul. 19, 1982, Ser. No. 399,269
Int. Cl.³ A63C *11/22*
U.S. Cl. 280—821 **6 Claims**

1. A ski pole hand grip comprising an elongated palm and finger grip, generally oval in cross-section, having a top and a bottom and which has a longitudinal recess for receiving one end of a ski pole, a generally annular, web shaped, finger knuckle shield which is integrally attached to the grip and a generally annular, web shaped thumb shield integrally attached to the top of the grip and which encircles the thumb of the user whereby the finger knuckle shield and the thumb shield together restrain the relative angular positions of the



thumb and fingers of a user to prevent the thumb from being bent back relative to the hand.

4,493,495

BINDING UNIT

Maynard W. Linn, 6336 N. Bergeron, Fresno, Calif. 93704

Filed Mar. 25, 1982, Ser. No. 362,021
Int. Cl.³ A63F *3/04*; A44B *21/00*
U.S. Cl. 281—45 **22 Claims**

1. A binding unit for loose-leaf sheet materials or the like of the type having an open position for insertion and a closed position wherein the loose-leaf materials are clamped therein comprising, in combination:

two legs, each of said legs having a free edge and a remote end spaced from said free edge, said free edges having cooperating material-engaging end portions;

a spline;

spline hinge means for coupling at least a first of said two legs to said spline in regions adjacent said remote end;

moving means coupled to at least said first of said two legs for moving said free edges between said closed position thereof and said open position thereof, said cooperating material-engaging end portions clampingly securing the loose-leaf sheet materials in said closed position, said moving means coupled to each of said two legs at said remote ends thereof to impart pivotal movement to said legs around said spline; and

latch means having a portion thereof coupled to said moving means for selectively maintaining said moving means in a latched position thereof to provide said clampingly securing of the looseleaf materials by said cooperating material-engaging end portions, said latch means comprising a male member and a female member, and said male member of said latch means releasably securable in said female member in said latched position thereof.

4,493,496

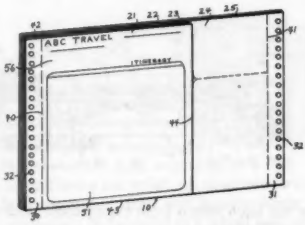
CONTINUOUS FORM MULTIPLE PLY ASSEMBLY

Rudolph T. Kaluza, 15650 E. Eldorado Dr., Aurora, Colo. 80013

Filed Jun. 14, 1983, Ser. No. 504,332

Int. Cl.³ B41L *3/00*; G09F *3/02*; B42D *15/00*

U.S. Cl. 282—11.5 A **4 Claims**



1. A multiple-ply assembly comprising an outer ply, an intermediate ply, and a back ply, having control margin strips along opposed longitudinal sides, the said control margin strips of all plies being separable from the remainder of the assembly by perforations, one longitudinal edge of the said outer ply being captured in one said control margin strip, the said outer ply extending partially across the lateral width of the assembly; both longitudinal edges of the said intermediate and back plies being caught in said control margin strips, the portion of the said intermediate ply which lies directly behind said outer ply being detachable from the remainder of the said intermediate ply by perforations, the said remainder being secured by peripheral adhesive means to the said back ply forming a pocket, the said back ply having longitudinal weakening lines marking out 3 longitudinal panels therein, one of the said panels containing the said pocket, the other 2 of the said panels containing a duplicate copy by carbon or carbonless means of information entered on the face of the said outer ply.

4,493,497

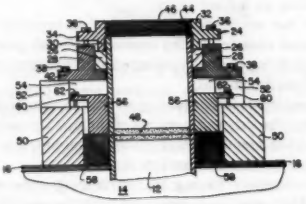
PIPE CONNECTION ASSEMBLY

Bobby E. Smith, 126 Back St. East, and Benjamin V. Smith, 130 Back St. East, both of Savannah, Ga. 31406

Filed Jun. 22, 1981, Ser. No. 275,579

Int. Cl.³ F16L *57/00*

U.S. Cl. 285—13 **2 Claims**



1. A pipe connection assembly for connecting a grout input pipe with a second pipe which extends from and runs into a gearbox of a vertical auger boring unit that is used to drill holes to construct piles, said pipe connection assembly comprising:

a first packing assembly including a first packing, a first top packing ring and a first packing base ring, said first packing being encased by and located between said first top packing ring, said first packing base ring and said second pipe,

a second packing assembly including a second packing,

a second top packing ring and a second packing base ring, said second packing being encased by and located between said second top packing ring, said second packing base ring and said second pipe,

wherein said second packing assembly is spaced along said pipes from the first packing assembly such that there is an opening along said pipes between a portion of said first packing assembly and a portion of said second packing assembly,

said first and said second packing assemblies being located with respect to the pipe connection such that any fluid escaping from the connection would first contact the first packing assembly and said opening before contacting the second packing assembly,

said opening being between said first packing base ring and said second top packing ring,

wherein the first and second packing assemblies are attached to each other,

said second packing base ring has raised portions spaced along the top thereof, said first packing base ring being attached to said raised portions,

said second top packing ring is attached to the top of the non-raised portions of said second packing base ring such that the top of said second top packing ring is below the top of said raised portions,

said second packing base ring being attached to the housing of the gearbox.

4,493,498

KNOTTER WITH AN IMPROVED GENEVA MECHANISM

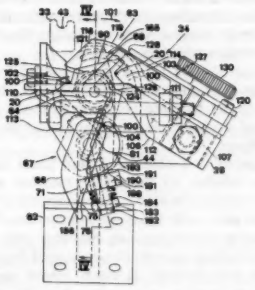
Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 30, 1982, Ser. No. 431,517

Claims priority, application United Kingdom, Oct. 7, 1981, 8130247

Int. Cl.³ A01D *59/04*; B65B *13/26*

U.S. Cl. 289—2 **15 Claims**



1. In a knotter having a twine holder operable to hold, during a knot-tying operation, a primary portion and a secondary portion of twine in which a knot is to be tied, a billhook rotatable through a first cycle and a second cycle during a knot-tying operation, the billhook being operable during the first cycle to position the primary and secondary portions of twine relative to each other in preparation for the knot-tying operation, the billhook being operable during the second cycle to tie the knot in the primary and secondary portions, the billhook comprising two jaws capable of being opened and closed, the improvement comprising: means contactable by the billhook during both the first and second cycles but operable to maintain the billhook jaws closed during the first cycle and to open and close the billhook jaws during the second cycle, and wherein the means contactable by the billhook comprises a cam mounted for rotation and being generally square in plan view with one pair of opposed corners being cut away so that, when one of the cut-away corners is contacted by the billhook,

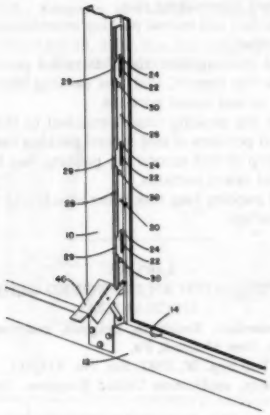
the jaws thereof remain closed, and with the other pair of opposed corners being arranged so that, when one of them is contacted by the billhook, the jaws thereof are opened.

4,493,499

DOOR LATCH

Paul R. Stenglein, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,131
Int. Cl.³ E05C 1/14
U.S. Cl. 292—158 **10 Claims**



1. Apparatus for securing, to a frame member, the swinging end of a hinged door in a closed position, said door including an end surface extending the thickness of the door and being in a plane generally tangent to an arc having the door hinge as its center of rotation which comprises:

at least one contact projection mounted to and extending from the door end surface, said contact projection including a contact face projecting from the end surface of the door and angled from a line parallel to the axis of rotation of the hinge;

a latch assembly including a base plate mounted to and slidable relative to the frame member and a rotatable contact means mounted thereon capable of being arranged in registration with the contact projection for securing the door in the closed position, said base plate having a front edge extending towards the door, said front edge defining at least one opening through which said at least one contact projection may pass when the door is rotated about the hinge and said latch assembly is in an open position; and

means for displacing the latch assembly between a closed position wherein the contact means is arranged in registration with the contact projection and an open position wherein the contact projection is not engaged by the contact means.

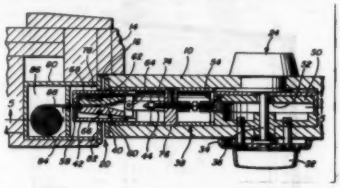
4,493,500

DEAD BOLT AND NIGHT CHAIN COMBINATION

Larry J. Stroup, 10 Clark Rd., Oswego, Ill. 60543

Filed Mar. 25, 1983, Ser. No. 478,711
Int. Cl.³ E05C 17/36
U.S. Cl. 292—262 **33 Claims**

1. In a security door lock assembly comprising a relatively movable, door-mounted portion, a relatively stationary jamb-mounted portion adapted for cooperation with said movable portion, a flexible guard element, means yieldably retracting the element inwardly into said stationary portion, strike plate means having a recess in the stationary portion through which the guard element is extended externally of the stationary portion, coupling means fixed to the element and seated within the recess of the strike plate means to limit the retraction of the element inwardly into the stationary portion, latch means mounted in the movable portion and projected into the recess for latching engagement with the coupling means, and manually operable means mounted on the movable portion to selec-



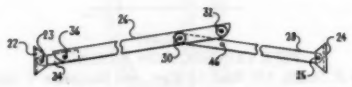
tively release the latch means from engagement with the coupling means, the improvement comprising a deadbolt mounted in the movable portion and displaceable by the manually operable means into the recess of the strike plate means, means mounting the latch means within the deadbolt for said projection into the recess, and means responsive to retraction of the deadbolt into the movable portion by the manually operable means for effecting said selective release of the latch means.

4,493,501

SECURITY LOCK FOR SLIDING DOORS OR WINDOWS

Earl E. Abel, 7703 S. 128th St., Seattle, Wash. 98178

Filed Apr. 15, 1983, Ser. No. 485,315
Int. Cl.³ E05C 17/34
U.S. Cl. 292—263 **9 Claims**



1. A locking mechanism for a sliding door or window which comprises:

a. a pair of anchor means, one of said anchor means adapted for mounting on a door fram , and the other adapted for mounting on a door casing;

b. a first bar member in the form of an inverted generally U-shaped channel having opposed sidewall portions, said first bar being pivotally mounted at its proximal end to one of the anchor means;

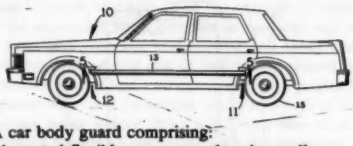
c. a second bar member having a cross section adapted to fit between the sidewall portions of the first bar member, said second bar member being pivotally mounted at its proximal end to the other anchor means,

said bar members having an overlapping zone where the second bar member is embraced with the channel between the side wall portions of the first bar member;

d. distal end and inner longitudinally displaced apertures formed through both sidewall portions of the first bar member in the area of the overlapping zone; and

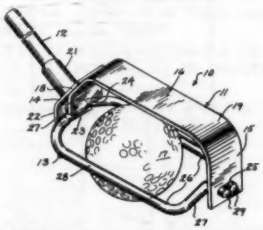
e. distal end and inner apertures formed through the second bar member in the area of the overlapping zone, said apertures having a longitudinal displacement corresponding to the apertures in the first bar member said apertures adapted for receiving removable pin means to connect the bar members, the second bar member being longitudinally positionable within the side wall portions of the first bar member so that the apertures can be aligned in different configurations.

4,493,502
CAR BODY GUARD
Valtin T. Campbell, Jr., P.O. Box 016777, Miami, Fla. 33101
Filed Sep. 6, 1983, Ser. No. 529,526
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—128 **9 Claims**



1. A car body guard comprising:
an elongated flexible strap wound up in a roll;
a housing enclosing the rolled-up strap and having an opening for passing said strap, said housing being shaped and dimensioned to be mounted in a wheel well on one side of the car body;
a fastener element on the outer end of said strap outside said housing to be grasped manually and pulled along said one side of the car body and attached to an attachment member in the other wheel well on that side of the car body;
and means for retracting the strap into said housing to a rolled-up condition upon separation of said fastener element from said attachment member in the other wheel well.

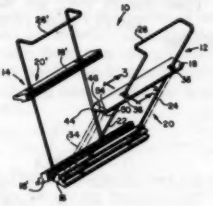
4,493,503
GOLF BALL RETRIEVER
John Jeninga, 114 Wisconsin St., Delavan, Wis. 53115
Filed Sep. 2, 1983, Ser. No. 529,169
Int. Cl.³ A63B *47/02*
U.S. Cl. 294—19 A **7 Claims**



1. In a golf ball retriever, a frame having longitudinally spaced, opposed frame portions, and a pair of transversely opposed, generally U-shaped bail members pivotally mounted to the frame between the opposed frame portions, said bail members being engageable with a stop provided on said frame to define a normal position for said members, and said bail members being pivotal from said normal position to pass a golf ball therebetween into the retriever and thereafter being pivotal under their own weight to return to normal position to entrap the golf ball in the retriever.

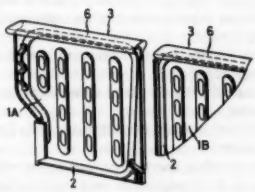
4,493,504
CARRIER FOR TRANSPORTING PAINTINGS AND OTHER SUBSTANTIALLY PLANAR ARTWORK
Robert L. MacHose, Rte. 1, Box 84, Zionsville, Pa. 18092
Filed Sep. 13, 1982, Ser. No. 417,481
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—146 **6 Claims**

1. A carrier for transporting paintings or other substantially planar artwork, comprising two assemblies, each assembly comprising:
a first elongated support member having a seat for receiving a first edge of a piece of artwork;
a second elongated support member having a seat for receiving a second edge of said artwork opposite said first edge, the second support member being positioned generally parallel to and spaced apart from the first support member with the seat of the second support member facing the seat of the first support member;
an elongated guide member comprising two generally parallel spaced apart guide rods extending through said support members in such a manner as to permit sliding adjustment of at least one support member on the guide rods so as to permit adjustment of the distance between the support members to conform to the corresponding dimension of said artwork so that in the adjusted position of said support members, the first and second edges of said artwork



are received within the respective seats of the support members;
retainer means for retaining the support members in the adjusted position to retain said artwork in place between the support members;
said carrier further comprising:
hinge means between the assemblies adjacent one end of the guide members permitting relative displacement of said assemblies between an open and a closed position;
spacer means on the guide member of at least one of the assemblies in the closed position to space the artwork in one of the assemblies from the other assembly or any artwork therein with sufficiently large clearance therebetween to avoid impingement by the other assembly or the artwork therein against the adjacent surface of said artwork.

4,493,505
REAR SEAT OF AN AUTOMOBILE
Takeshi Yamawaki, and Kunio Nishiyama, both of Okazaki, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Apr. 14, 1983, Ser. No. 485,110
Claims priority, application Japan, May 6, 1982, 57-65849[U]
Int. Cl.³ B60N *1/00*
U.S. Cl. 296—63 **8 Claims**



1. A rear seat of an automobile, adapted to be selectively securing thereto as a separate type seat back, and divided into first and second sections in a widthwise direction of the auto-

mobile, the respective first and second sections being forwardly foldable independently of each other, or a bench type seat back being integral in the widthwise direction of the automobile and forwardly foldable, comprising:

a frame having a first and second main panel; and

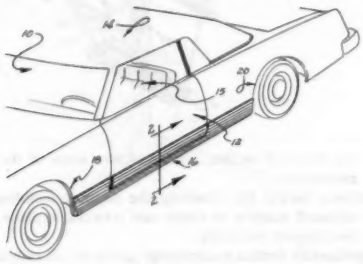
at least one reinforcement member for reinforcing an outer peripheral portion of said first and second main panel wherein said frame when utilized in said bench type seat back is of such an arrangement that said first and second main panels are integrally connected through said at least one reinforcement member to each other and when utilized in said separate type seat back, said first and second main panels are parallelly arranged.

4,493,506

VEHICLE ROCKER PANEL STRUCTURE

Michael P. Alexander, Grosse Ile, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Mar. 29, 1982, Ser. No. 362,629
Int. Cl.³ B62D *27/02*
U.S. Cl. 296—209 **10 Claims**



1. In a vehicle having an original rocker panel including at least one load-bearing member extending longitudinally along a lower side thereof, the improvement comprising:

an added first support member, positioned below and secured to the exterior of the original rocker panel member a lower portion of the added first support member extending laterally outward from the original rocker panel and the upper portion of the added first support member being secured directly to an exterior vertical surface of the original rocker panel.

4,493,507

TILTING TYPE SUNROOF

Kazuhisa Nagata, Okazaki; Keiji Mori, Toyota, and Asao Ogasawara, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 6, 1983, Ser. No. 492,329
Claims priority, application Japan, May 6, 1982, 57-75756
Int. Cl.³ B60J *7/08*
U.S. Cl. 296—216 **5 Claims**

1. A tilting type sunroof comprising:

a roof panel having one end portion pivotably connected to the front edge portion of an opening formed in a motor vehicle roof;

brackets rigidly fixed to said roof panel adjacent each side edge thereof;

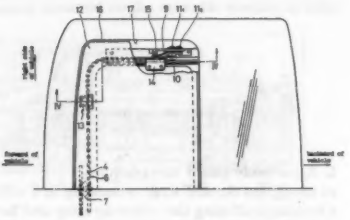
guide rails fixedly disposed along opposite side edges of said opening;

a shoe fitted in each of said guide rails for movement along the same;

a guide member secured to said edges of said opening adjacent each of said guide rails and having a guide groove which is inclined with respect to each of said guide rails;

a pair of links each having one end portion engaged with a guide groove formed in each of said brackets, having another end portion engaged with said guide groove in said guide member, and pivotably connected to said shoe at a position corresponding to the remaining one apex of a triangle where said engaged points constitute two apexes thereof; and

a means for driving said shoe to move along said guide rail;



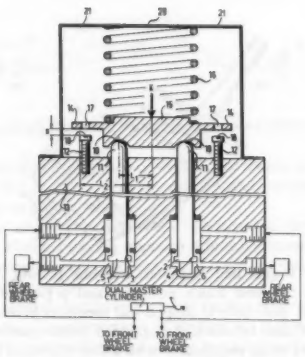
said guide groove in said guide member being formed with a large inclination angle in the region where said roof panel is opened to a large extent, during the movement of said another end portion of said lift link along said guide groove and with a small inclination angle in the region where said roof panel is closed, during the movement of said another end portion of said lift link.

4,493,508

DUAL-CIRCUIT PRESSURE CONTROL VALVE

Bernd Schopper, Hattersheim, and Peter Tandler, Falkenstein, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 231,692, Feb. 5, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 438,195
Int. Cl.³ B60T *11/34, 8/26*
U.S. Cl. 303—6 C **1 Claim**



1. A dual-circuit pressure control valve having a changeover point determined from the outside by a control force for use in a hydraulic dual-circuit brake system of automotive vehicles comprising:

a housing having two parallel control valve actuating tappets projecting outwardly from and disposed along a common line in one end surface of said housing, each of said two actuating tappets enabling a control of pressure in a different one of said two brake circuits;

a common yoke having one surface abutting each of said two actuating tappets and the opposite surface acting upon by said control force, said yoke having two extensions each extending in opposite directions from said yoke along and parallel to said common line wherein said yoke is acted upon by said control force intermediate said two tappets

and wherein said control force is generated by an elongated helical spring held at one end by a spring bearing housing and acting at the other end on said yoke;

a pair of valves in said housing respectively cooperating with the inner ends of said tappets, each valve comprising a piston on the inner end of the associated tappet which is disposed in a cylindrical chamber which surrounds the inner end of the associated tappet, wherein outward movement of the associated tappet closes the piston against a valve seat surface of the respective chamber;

a pair of adjustable stops disposed in said one end surface between said yoke and said housing and along said common line, each of said pair of stops being spaced from an associated one of said two extensions by a predetermined distance when said valves are closed and each of said pair of stops being spaced from a different one of said two actuating tappets to cooperate with the associated one of said two extensions such that each of said two extensions moves into abutment with its associated one of said pair of stops when the associated one of said two actuating tappets has moved into said housing and wherein the valve closure travel of said valves is controlled by the predetermined spacing between the extensions of said yoke and said adjustable stops, each of said pair stops being an adjustable stop screw capable of being screwed to a predetermined depth into a corresponding bore in said one end surface of said housing, each of said two extensions including a bore opposite an associated one of said stop screws, said bore having a smaller diameter than the head of said associated one of said stop screws;

and access means for enabling a separate adjustment of each of said stop screws, said access means comprising a pair of openings in said spring bearing housing aligned with heads on said stop screws, whereby each of said stop screws may be screwed into or out of said corresponding bore by a tool inserted through said openings.

4,493,509

TWO-FLUID NONFLAMMABLE HYDRAULIC SYSTEM

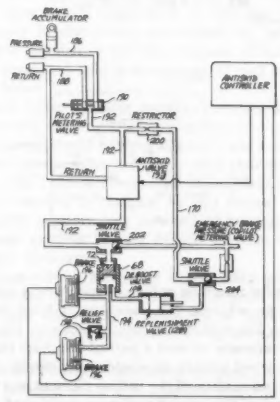
Jerome R. Kilner, Bellevue; Eugene T. Raymond, Kent, and Steven M. Warren, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT US 82/01335, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO 84/01333, PCT Pub. Date Apr. 12, 1984

This PCT application filed Sep. 27, 1982, Ser. No. 451,655

Int. Cl.³ B60T *11/10*

U.S. Cl. 303—13 28 Claims



1. An aircraft ground wheel braking system, comprising:

at least one ground wheel including a hydraulic brake;

a pressure transmitter comprising a housing and a piston movable in said housing, and dividing said housing into a first chamber on one side of the piston and a second chamber on the opposite side of the piston;

a brake control system including first conduit means containing a first relatively flammable hydraulic fluid at supply pressure, second conduit means containing first hydraulic fluid at return pressure, third conduit means connected to the first chamber of said pressure transmitter, and brake control valve means for switching between a first position in which the third conduit means is connected to the first conduit means, and a second position in which the third conduit means is connected to said second conduit means;

fourth conduit means interconnected between the second chamber of the pressure transmitter and the hydraulic brake; and

a relatively nonflammable second hydraulic fluid within said second chamber, said fourth conduit means and said hydraulic brake,

whereby movement of the brake control valve means into its first position will communicate supply pressure provided by the first hydraulic fluid to the piston of said pressure transmitter and said piston will transmit such pressure to the second hydraulic fluid, and the pressurized second hydraulic fluid will apply the hydraulic brake, and the first hydraulic fluid will be isolated from heat generated by the applied brake.

4,493,510

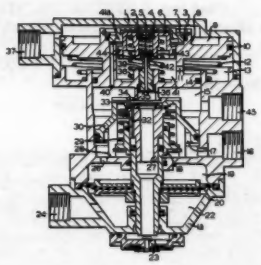
BRAKE PRESSURE CONTROL VALVE FOR TRACTOR-TRAILER VEHICLES

Karl-Heinz Delke, Pattensen; Hans-Joachim Schulz, Wedemark, and Jürgen Sandmann, Wennigsen, all of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,901

Int. Cl.³ B60T *15/02*

U.S. Cl. 303—28 15 Claims



1. A brake pressure control valve for a vehicle braking system having a trailer brake control valve comprising, a relay piston responsive to a control pressure for controlling the operation of a first combination inlet and outlet valve in which the first inlet valve interconnects a fluid pressure inlet connection with a working chamber having a fluid pressure outlet connection and in which the first outlet valve interconnects said working chamber to an exhaust connection, said relay piston includes a piston surface which is acted upon by the control pressure fed to a control chamber, said relay piston includes a first partial surface which is acted upon by pressure fed to said working chamber and includes a second partial surface which is acted upon by pressure fed to an auxiliary control chamber, a second combination inlet and outlet valve in which the second inlet valve supplies pressure to said auxiliary control chamber in proportion to the control pressure, and in which the second outlet valve directly exhausts said auxiliary control chamber to atmosphere, said second combination inlet and outlet valve is arranged so that the fluid pressure supply to the second inlet valve is separated from the fluid pressure exhaust to the second outlet valve, the fluid pressure

supply of the inlet valve is selectively connected with the control chamber and with the working chamber, and the fluid pressure exhaust of the outlet valve is directly connected to atmosphere, said second combination inlet and outlet valve is disposed within the relay piston, the second outlet valve of the second combination inlet and outlet valve is directly connected to the first outlet valve of the first combination inlet and outlet valve, said relay piston exhibits a first partial chamber and a second partial chamber which are separated by an operating piston, an extension disposed in the bottom of the first partial chamber and extending into the partial chamber as well as into the working chamber, the extension in the working chamber is an outlet valve seat for the first outlet valve of the first combination inlet and outlet valve, and the extension in the first partial chamber is an outlet valve seat for the second outlet valve of the second combination inlet and outlet valve, a circular shoulder is provided on the operating piston which functions as a second inlet valve seat for the second inlet valve of the second combination inlet and outlet valve, the second inlet valve seat includes a spring-loaded double valve body and which together with an outlet valve seat, forms the outlet valve of the second combination inlet and outlet valve, the second inlet valve is moved by the opeating piston to an open position while the second outlet valve assumes a closed position, a compression spring is disposed in the first partial chamber and has one end resting against the operating piston and has its other end resting on the bottom of the first partial chamber, the second partial chamber is connected with the working chamber by a passageway, the first partial chamber is connected with the auxiliary control chamber by a bore hole, and the first partial chamber is connected to atmosphere via the second outlet valve.

4,493,511

COMBINED BC PRESSURE-MAINTAINING VALVE AND QUICK SERVICE BULB EXHAUST VALVE

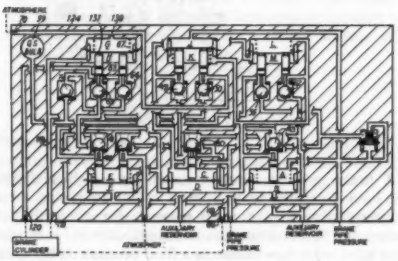
David J. Wickham, Chippenham, England, assignor to Westinghouse Brake and Signal Co. Ltd., Chippenham, England

Filed Sep. 8, 1982, Ser. No. 416,073

Claims priority, application United Kingdom, Sep. 11, 1981, 8127543

Int. Cl.³ B60T 15/52, 17/00

U.S. Cl. 303—36 **3 Claims**



1. In a control valve assembly for a railway braking system which includes: a brake pipe pressure; a brake cylinder which is exhausted to release a brake and pressurized to apply the brake; and, a brake cylinder pressure-maintaining valve which, during brake application caused by reducing brake pipe pressure, takes air from a quick service bulb charged at the brake pipe pressure and feeds it into the brake cylinder until the pressure reaches a minimum brake application pressure; wherein the improvement comprises:

an exhaust means for employing the brake cylinder pressure-maintaining valve as a quick service exhaust valve for exhausting the pressure in the quick service bulb during brake release; and

an opening means for immediately opening the brake cylinder pressure-maintaining valve on initiation of brake release.

4,493,512

SPHERICAL AND CYLINDRICAL BEARINGS AND METHOD OF MANUFACTURING

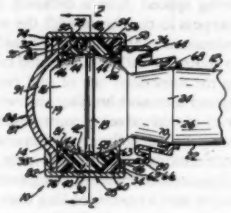
Joseph E. Smith, Jr., Birmingham, Mich., assignor to O & S Manufacturing Company, Whitmore Lake, Mich.

Continuation-in-part of Ser. No. 286,470, Jul. 24, 1981, Pat. No. 4,386,869. This application Mar. 9, 1982, Ser. No. 356,368

The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.

Int. Cl.³ F16C 32/00

U.S. Cl. 308—2 R **7 Claims**



1. A bearing assembly comprising an inner member having a peripheral bearing surface of regular predetermined contour, a tubular shell, a split bearing ring disposed in said shell and having a bearing surface in sliding engagement with the peripheral bearing surface of said inner member, means in said shell holding said bearing ring and biasing said bearing ring in a direction urging the bearing surface of said bearing ring towards the peripheral bearing surface of said inner member, wherein the area of said bearing surfaces in mutual sliding engagement is less than the total area of one of said bearing surfaces.

4,493,513

BEARING CAGE FOR RETAINING ROLLING ELEMENTS

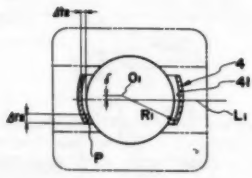
Hiroyuki Osawa, Kamakura, and Yasutaka Ishida, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,763

Claims priority, application Japan, Jun. 23, 1982, 57-93038[U]

Int. Cl.³ F16C 33/38, 33/42

U.S. Cl. 384—533 **7 Claims**

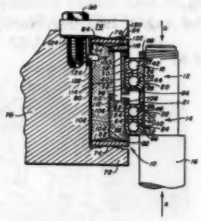


1. In a cage for retaining rolling elements of a rolling bearing, of the type wherein the cage has at least one pocket formed therein for retaining a rolling element, the improvement which comprises: at least a part of the inner face of each pocket has a curved surface of substantially similar configuration to the curved surface of the rolling element and the center of the curvature of the curved surface is positioned to deviate radially from the pitch circle of the rolling element at a predetermined distance.

4,493,514
MECHANISM FOR PROPORTIONATELY LOADING DUAL THRUST BEARING ASSEMBLIES AGAINST AXIAL THRUST LOADS

John W. Henry, IV, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1984, Ser. No. 588,182
Int. Cl.³ F16C *19/10, 19/28*
U.S. Cl. 384—613 17 Claims



1. A mechanism for proportionately distributing bidirectional axial thrust loads acting on a rotating shaft, comprising:

a first thrust bearing assembly concentrically mounted on said rotating shaft and adapted to transmit a first portion of said bidirectional axial thrust loads acting on said rotating shaft;

a second thrust bearing assembly concentrically mounted on said rotating shaft and adapted to transmit a second portion of said bidirectional axial thrust loads acting on said rotating shaft;

a stationary support member disposed proximal said rotating shaft, said stationary support member further comprising first and second fulcrums;

a first annular load lever concentrically disposed about said rotating shaft and cooperating with said first fulcrum to alternately transmit said bidirectional axial thrust loads thereto;

a second annular load lever concentrically disposed about said rotating shaft and cooperating with said second fulcrum to alternately transmit said bidirectional axial thrust loads thereto;

a first thrust transfer member concentrically disposed about said rotating shaft and adapted to cooperate with said first thrust bearing assembly, a first segment of said first annular load lever and a first segment of said second annular load lever such that said first portion of said bidirectional axial thrust loads transmitted by said first thrust bearing assembly is alternately transmitted by said first thrust transfer member to said first segment of said first annular load lever and said first segment of said second annular load lever;

a second thrust transfer member concentrically disposed about said rotating shaft and adapted to cooperate with said second thrust bearing assembly and a second segment of said first annular load lever such that said second portion of said bidirectional axial thrust loads acting in a first axial direction transmitted by said second thrust bearing assembly is alternately transmitted by said second thrust transfer member to said second segment of said second annular load lever;

force transmitting means for transmitting said second portion of said bidirectional axial thrust loads in a second axial direction alternately transmitted to said second thrust transfer member by said second thrust bearing assembly; and

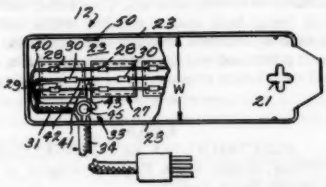
a third thrust transfer member concentrically disposed about said rotating shaft and adapted to cooperate with said force transmitting means and a second segment of said second annular load lever such that said second portion of said bidirectional axial thrust loads in said second axial direction is alternately transmitted by said force transmitting means to said second segment of said second segment of said second annular load lever by said third thrust transfer member,

whereby when said rotating shaft is subjected to said bidirectional axial thrust loads in said first axial direction said first portion of said bidirectional axial thrust loads is transmitted to said first segment of said first annular load lever and said second portion of said bidirectional axial thrust loads is transmitted to said second segment of said first annular load lever to cause a first reaction force in said first fulcrum of said stationary support member equal in magnitude and in an opposed direction to said bidirectional axial thrust loads in said first direction and when said rotating shaft is subjected to said bidirectional axial thrust loads in said second direction said first portion of said bidirectional axial thrust loads is transmitted to said first segment of said second annular load lever and said second portion of said bidirectional axial thrust loads is transmitted to said second segment of said second annular load lever to cause a second reaction force in said second fulcrum of said stationary support member equal in magnitude and in an opposed direction to said bidirectional axial thrust loads in said second direction.

4,493,515
MULTIPLE ELECTRICAL OUTLET STRIP CONSTRUCTION

Charles A. Banks, Westville, N.J., assignor to SL Industries, Inc., Marlton, N.J.

Filed Apr. 15, 1982, Ser. No. 368,762
Int. Cl.³ H01R *9/00*
U.S. Cl. 339—14 L 8 Claims



1. A cased electrical component comprising:

a metal casing;

an electrical component mounted within said metal casing;

an electrical cord leading into said casing from the exterior thereof and operatively connected to said electrical component; and

means for simultaneously providing passage of said electrical cord through said casing and providing grounding of said electrical component to said casing, comprising: means defining a cord-receiving opening in said casing; tabe means for forming a ground; said tab means formed from a portion of said metal casing and extending into said cord-receiving opening from said means defining said opening, and bendable out of the way of said cord; and an electrical wire attached to said electrical component and to said tab means.

4,493,516
ELECTRICAL DUCTING SYSTEM

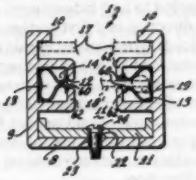
Gijsbertus Attema, Dillenburgstraat 1, Gorinchem, Netherlands

Continuation of Ser. No. 164,241, Jun. 30, 1980, abandoned.
This application Dec. 22, 1982, Ser. No. 452,297
Claims priority, application Netherlands, Jul. 2, 1979, 7905150; Oct. 1, 1979, 7907278
Int. Cl.³ H01R *25/14*
U.S. Cl. 339—21 R 4 Claims

1. In an electrical current supply duct having one or more

insulating channels of substantially rectangular cross section including a bottom, a pair of side walls, a pair of flanges defining a narrow access slot into said insulating channel, and a current conductor mounted within each said insulating channel, the improvement comprising:

each of said current conductors being a hollow tubular structure of resilient electrically conductive material, said tubular structure having a pair of curved lips terminating in upper edges outward of said tubular structure and spaced from and extending towards said side walls, each lip having a convex surface facing one of said flanges, each said convex surface being movable into contact with one of said flanges upon attempted rotation of said conductor, said tubular structure having side portions curving outwardly to contact with said side walls and a bottom portion contacting the bottom of said insulating channel at least at two spaced apart points, to thereby restrain said conductor against movement within the insulating channel by said contact with the bottom, side walls and flanges of said channel, said lips being resiliently spreadable from each other so as to make spring contact with an electrical contact pin inserted either between said opposing convex surfaces or axially into said conductor, said conductor strip being held against rotation within said insulating channel by coaction between said side lobes, said spaced apart points and said lips with said side walls, said bottom and said flanges respectively of said insulating channel.



4,493,517

ELECTRICAL SOCKET CONNECTOR

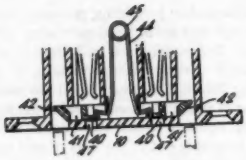
Brian Hillary, Bognor Regis, England, assignor to WKR Limited, Bognor Regis, England

Continuation of Ser. No. 326,292, Dec. 1, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 595,647

Claims priority, application United Kingdom, Dec. 3, 1980, 80038827

Int. Cl.³ H01R *13/453*

U.S. Cl. 339—42 **11 Claims**



1. An electrical socket connector to receive a multiple-pin shrouded plug, said socket connector comprising a body portion having at least live and neutral sockets and having a recess adapted to receive a shroud surrounding pins of a plug, and having shutters for the live and neutral sockets comprising a movable shutter member or members with spring biasing means biasing the shutter member or members outwardly towards a portion or portions of said recess, the shutter member or members, in the biased position, extending across the live and neutral sockets and the or each shutter member having a portion extending into said recess, said portion having a cam surface arranged for engagement by a shroud of a plug so as to be moved against the spring bias on insertion of a shrouded plug in a direction oriented at a nonzero angle with respect to the direction of movement of the shrouded plug, thereby to move the shutter member to an open position.

4,493,518

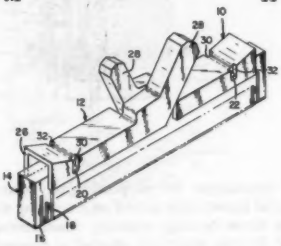
EXTRACTOR MEANS MULTI-PLANE INTERCONNECTION SYSTEM

John C. Asick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 4, 1983, Ser. No. 520,397

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **11 Claims**



5. Means for extracting an electrical connector plug from a mating electrical receptacle, said extraction means comprising

a pair of elongated hermaphroditic members each having oppositely directed first and second ends, each first end defining a handle and means to slidingly engage the other of said members, each said second end having means to pivotally engage said plug and means to engage said receptacle with a cam action, whereby activation of said handles causes rotation of said members about said pivots to extract said plug from said receptacle by cam action.

4,493,519

ADAPTER PLUG FOR CURRENT SUPPLY RAIL SYSTEMS

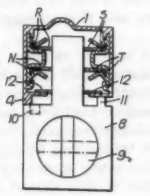
Kolbjorn Olsen, Trondenes, 9400 Harstad, Norway

Filed Sep. 18, 1978, Ser. No. 943,226

Claims priority, application Norway, Sep. 30, 1977, 773349

Int. Cl.³ H01R *13/625, 13/629*

U.S. Cl. 339—75 M **6 Claims**



6. An adaptor plug for connecting electrically powered devices to at least two different types of current supply rails, comprising:

a contact bearing portion having contact means which are movable and engage at least one current-carrying conductor inside a current supply rail;

release button means, disposed on a surface of the adaptor plug, to unlock said contact means when said release button means is depressed upon a correct connection with said current supply rail;

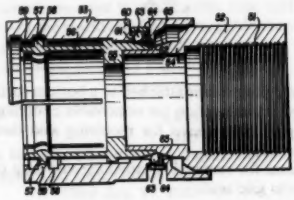
a guide rib disposed on said surface of the adaptor plug such that an outwardly facing side of said guide rib and an outwardly facing side of said release button means are equidistant from a central plane through said contact bearing portion.

4,493,520

ELECTRICAL PUSH-PULL CONNECTOR

Jeffrey N. Davies, Canterbury, England, assignor to Allied Corporation, Morris Township, N.J.

Filed Nov. 17, 1982, Ser. No. 442,333
Claims priority, application France, Dec. 10, 1981, 81 23254
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—91 P **5 Claims**



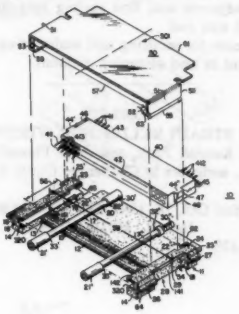
1. An electrical push-pull connector comprising a first and a second mating connector members, each having an insulating unit at least partially mounted inside a cylindrical body, and at least two electrical contact elements, the electrical contact elements of said first connector member being matable with the contact element of said second connector member, and being arranged so that they are respectively electrically connected when said first and said second connector members are mated, and mechanical means provided on said first connector member and adapted to permit the mating of said first and said second connector members, and their locking in said mating position; in which said mechanical means comprise a cylindrical exterior sleeve member, being coaxially mounted on said cylindrical body, and axially movable between a central locking position and two unlocking positions on both sides of said central locking position, a cylindrical interior sleeve member coaxially mounted on said body and having a plurality of resilient tongues extending axially towards the mating end of said first connector member, each of said tongues being provided with a first interior protrusion adapted to penetrate in an annular groove provided on said second connector member when said first and second connector members are mated, and each of said tongues being provided with a second exterior protrusion adapted to cooperate with a cam surface provided on the interior surface of said exterior axially movable sleeve member to permit the locking and the unlocking of said first and second connector members when they are mated, said exterior axially movable sleeve member having also means for bringing it back automatically into its central locking position, said means for bringing back automatically said exterior movable sleeve member into its central locking position including an open V groove provided on the peripheral surface of said body of said first connector member, said V groove being fairly wide and providing a zone of minimal diameter and two ramps provided by the lateral walls of the V groove, the width of said V groove being at least equal to the stroke of said exterior axially movable sleeve member; and spring means, mounted on said exterior axially movable sleeve member, said spring means providing a resilient ring means round said body of said first connector member, adjacent to said V groove, being biased towards its rest position where it is located in said zone of minimal diameter, and being mounted on said exterior axially movable sleeve member so that said rest position coincides with the locking position of said sleeve member, characterized in that the said spring means comprise a split ring obliged by its elasticity to adopt a position in which its diameter tends to become minimal, and a series of protuberant members placed at regular intervals in contact with the interior surface of the split ring, these protuberant members leaning against one or the other of the lateral walls of the V groove provided on the peripheral wall of the interior sleeve member.

4,493,521

CONNECTOR HOLDER ASSEMBLY

James F. Simon, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1982, Ser. No. 453,400
Int. Cl.³ H01R *13/621*
U.S. Cl. 339—92 M **11 Claims**



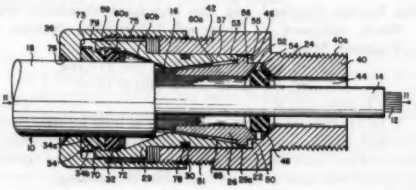
1. An electrical connector holder assembly comprising:
a frame comprising a continuous back plate and a first and second arm, each arm attached to an opposite end of said back plate and forming a recess therewith;
a first and second jackscrew extending through said first and second arms, respectively;
means for rotatably mounting said first and second jackscrew to said first and second arm, respectively;
a connector;
said mounting means comprising said connector positioned in said recess between and in contact with said jackscrews and adjacent to said back plate;
a removable cover for said connector on the opposite side of said connector from said back plate to retain said connector within said recess;
said cover being flexible but stiff and engaging said arms to retain said connector within the recess of said frame.

4,493,522

SEALED CABLE CONNECTOR

Joseph P. Law, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Nov. 1, 1982, Ser. No. 438,122
Int. Cl.³ H01R *4/00, 17/18*
U.S. Cl. 339—94 C **16 Claims**



1. A cable connector for attachment to an electrical cable having a conductive sheath and a plurality of conductors therein comprising:

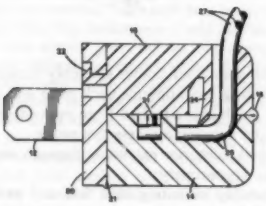
a body having a cable receiving end, a conductor egressing end and a central opening extending therethrough;
a conductive member supported in said body for engagement with said conductive sheath;
a gland nut for movable securement to said body;
a sealing member supported between said conductive member and said body for sealing said cable therebetween;
a clamping element for receiving said conductive member and forming therebetween a chamber for receipt of said conductive sheath, said clamping element further including a sealing ring for sealable engagement with said cable and a pushing element movably secured to said clamping element adjacent said first sealing ring for contact with said gland nut; and
retaining means for securing said sealing ring and said pushing element in said clamping element.

4,493,523

ADAPTIVE STRAIN RELIEF FOR WIRING DEVICES

Henry Leong, Kendall Park, and John Fiumefreddo, Colonia, both of N.J., assignors to Challenger Circle F, Inc., Trenton, N.J.

Filed Oct. 18, 1983, Ser. No. 541,801
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—105 **1 Claim**



1. A wiring device for terminating electrical cords comprised of:
a first segment;
a second segment pivotally arranged with said first segment and having an entry hole for receiving an end of an electric cord;
a serrated corner arranged on said first segment to be opposite said entry hole when said segments are in a closed position;
a flexible finger arranged on said second segment in proximity to said entry hole so that an electric cord inserted in said entry hole is locked between said finger and said serrated corner when said segments are in a closed position, thereby providing strain relief.

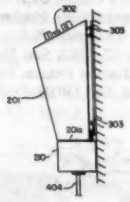
4,493,524

FACTORY DATA COLLECTION TERMINAL CONDUIT ENCLOSURE

Jay Kaplan, Wayland, and Ray Marchant, Westboro, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 26, 1981, Ser. No. 277,784
Int. Cl.³ G06F *1/00*; H01R *13/60*
U.S. Cl. 339—125 R **4 Claims**

1. In a computer system comprising at least a data collection terminal, a central processing unit (CPU) and a bus having data and address lines between said CPU and said data collection terminal, said data collection terminal comprising:
(1) a conduit enclosure portion including,
(a) a back plate;
(b) a face plate unit having a front wall and opposing side walls and fastening means for fastening the face plate unit to said back plate unit to form a box-like enclosure with said back plate unit the fastening means allowing for sliding of the face plate unit relative to the back plate unit in a direction parallel to the front wall and side walls;
(c) a first signal plug means for coupling with said data and address lines; and
(d) mounting means incorporated in said back plate unit for mounting said conduit enclosure portion to a wall;
(2) a data collection portion including,



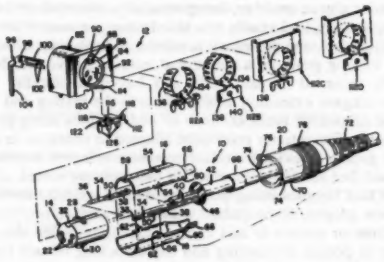
(a) second signal plug means attached to a bottom surface of said data collection portion for removable coupling with said first signal plug means for receiving said data and address lines; and
(b) bracket means for removably attaching said data collection portion to said wall.

4,493,525

ELECTRICAL PLUG CONNECTOR AND RECEPTACLE THEREFOR

Lawrence A. Hall, Harrisburg; Linn S. Lightner; William B. Long, both of Camp Hill; Suel G. Shannon, Harrisburg, and Daniel E. Stahl, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 31, 1983, Ser. No. 462,278
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **12 Claims**



1. An electrical connector of the plug type comprises a dielectric housing member in which electrical terminals are secured, contact sections of the electrical terminals extend outwardly from a front surface of the housing member and conductor-securing sections of the electrical terminals are to be connected to electrical conductors of a shielded cable, metal clamshell members are mounted on the housing member forming an outer contact surrounding the housing member and including a forward section covering the contact sections of the electrical terminals and a rear section for connection to a conductive shield of the shielded cable, an insulating sleeve for disposition onto the clamshell members and including a section for engagement with the cable, characterized in that:
said housing member has terminal-receiving passageways which have stop surfaces therein;
said conductor-securing sections are crimpable onto conductive cores of insulated electrical conductors of the shielded cable and said electrical terminals have latching members and stop sections for engagement with said stop surfaces in said terminal-receiving passageways to latch-

ably secure said electrical terminals in said terminal-receiving passageways;

said clamshell members have flanges along their edges in engagement with each other, lugs of one of the clamshell members disposed in recesses in the other clamshell member positioning said clamshell members together;

said insulating sleeve has internal recesses in which said flanges are disposed, said recesses being substantially larger than said flanges to permit said insulating sleeve to rotate relative to said outer contact within the confines of said recesses; and

said clamshell members have U-shaped rear sections which together form an annular member onto which an end of a shield of the shielded cable is to be positioned, and a ferrule member is positionable onto said annular member over the shield end and is crimpable thereon to electrically connect the shield to said outer contact and to secure the clamshell members together.

4,493,526

JACK

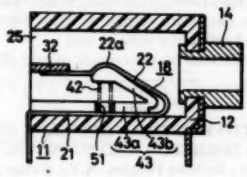
Toru Masuda, Higashiosaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jan. 17, 1983, Ser. No. 458,518

Claims priority, application Japan, Feb. 27, 1982, 57/10728[U]

Int. Cl.³ H01R *17/18*

U.S. Cl. 339—183 **8 Claims**



1. A jack comprising:

a hollow rectangular prismatic body fabricated of an insulating material, said body having a front panel, right and left side panels and top and bottom panels, the front panel having a plug insertion hole therein;

a U-shaped contact piece formed of a resilient sheet metal and mounted in said body, one of the two legs of said U-shaped contact piece being adapted to move when engaged by a plug inserted into said body through said plug insertion hole and the other of said two legs being a stationary part which is fixed to an inner wall of said bottom panel, said two legs being interconnected by a bent portion of said U-shaped contact piece which is positioned toward said front panel with said movable and stationary legs of said contact piece extending from said bent portion in directions away from said plug insertion hole;

a sheet metal keep plate mounted on said stationary leg of said U-shaped contact piece to press said stationary leg against said bottom panel, said keep plate having an upright portion acting as a spring holder, said upright portion being made by cutting and bending a portion of said keep plate to stand upright, the distance between the tip of said spring holder and said movable leg of said contact piece being selected so that when a plug inserted into said body engages the movable leg of said contact piece a portion of said movable leg will be brought into contact with the tip of said spring holder, thereby preventing said movable leg from excessive displacement by the plug inserted into the body; and

a coiled spring held around said spring holder to bias said movable leg of said contact piece towards said top panel of said body, thereby to supplement the resiliency of said movable contact piece.

4,493,527

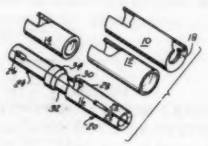
SOCKET CONTACT FOR ELECTRICAL CONNECTORS

R. Amelia Piscitelli; Valentine J. Hemmer, both of Sidney, and Eric F. Shepler, Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 429,721

Int. Cl.³ H01R *13/12*

U.S. Cl. 339—258 R **1 Claim**



1. A socket contact for electrical connectors comprising an elongate formed metal contact liner sleeve having a front contact portion and a rear terminal portion, each of said portions located on a respective side of a midsection, a formed metal rear sleeve mounted over said terminal portion and secured thereto and a formed metal outer front sleeve mounted over said contact portion secured thereto and having a rear end adjacent the midsection of said contact liner sleeve characterized by an inner front sleeve mounted within said outer front sleeve having a greater wall thickness and of a shorter length than said outer front sleeve to form a rear facing end adjacent the midsection of said contact liner sleeve, said outer front sleeve having the rear end thereof formed over the rear facing end of said inner front sleeve to form a retention shoulder at the midsection of the socket contact.

4,493,528

FIBER OPTIC DIRECTIONAL COUPLER

Herbert J. Shaw, Stanford, and Ralph A. Bergh, Palo Alto, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

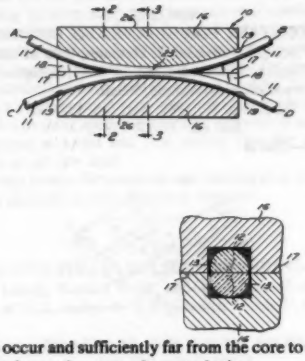
Filed Apr. 11, 1980, Ser. No. 139,511

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.15 **10 Claims**

1. In a fiber optic directional coupler: a pair of blocks having generally planar confronting faces in proximity to each other, generally aligned slots opening through the faces of the blocks and having bottom walls which converge toward the centers of the slots and diverge toward the edges of the blocks, and a strand of single mode fiber optic material mounted in each of the slots along a path corresponding to the bottom wall of the slot, the cladding on the confronting sides of the strands being removed even with the faces of the blocks to a predetermined distance to place the core portions in close proximity to each other to form a region of interaction in which light is transferred between the strands, the predetermined distance within

a predetermined critical zone, the critical zone defining a region sufficiently close to the core to permit evanescent coupling to occur and sufficiently far from the core to substantially eliminate losses due to mode perturbation.

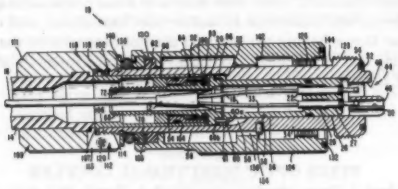


4,493,529

ELECTROMAGNETIC ENERGY SIGNAL-CARRYING CONNECTOR HAVING SECURE STRAIN-RELIEF MECHANISM

John S. Doty, Yucaipa, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jul. 30, 1982, Ser. No. 403,446
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 12 Claims



12. A connector for cables having strength member filaments and electromagnetic energy signal-carrying means, and termination means therefor, comprising:

an enclosing structure having means for receipt of said termination means;

a strain relief having a body, first means securing said strength member filaments of said cables to said body and second means for maintaining the securing of said filaments to said body;

means coupled to said enclosing structure for securing said connector to a mating connector; and

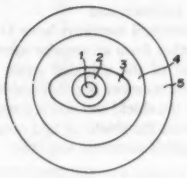
uncoupling prevention means positioned between said connector securing means and said first and second means to prevent uncoupling thereof when said connector securing means is used to secure together, or to disengage, said mating connectors.

4,493,530

SINGLE POLARIZATION OPTICAL FIBERS

Hiroshi Kajioka, Hitachi; Toshihide Tokunaga, Kitaibaraki, and Junkichi Nakagawa, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,889
Claims priority, application Japan, Aug. 18, 1981, 56-129139
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.34 8 Claims



7. A single polarization optical fiber comprising:

a circular core having a predetermined first refractive index;

a circular cladding positioned on the outside of said circular core and having a second refractive index smaller than said first refractive index;

an elliptical jacket positioned on the outside of said circular cladding containing F_2O for decreasing refractive index and P_2O_5 for lowering softening temperature and having an intermediate third refractive index between said first and second refractive indices; and

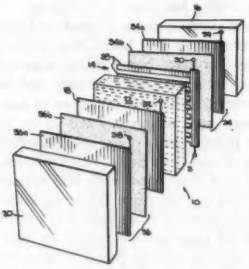
a support positioned on the outside of said elliptical jacket.

4,493,531

FIELD SENSITIVE OPTICAL DISPLAYS, GENERATION OF FIELDS THEREFOR AND SCANNING THEREOF

William Bohmer, Jackson Heights, N.Y.; Walter J. Betancourt, Oak Ridge, and Louis S. Hoffman, Morriston, both of N.J., assignors to Control Interface Company Limited, Randolph, N.J.

Continuation of Ser. No. 165,753, Jul. 3, 1980,. This application Apr. 1, 1983, Ser. No. 479,349
Int. Cl.³ G02F 1/133, 1/137, 1/135, 1/01
U.S. Cl. 350—336 25 Claims



1. A field sensitive display device for forming a display when subjected to visible light comprising a field sensitive material, spaced electrodes for inducing a field, means for containing the field sensitive material with the spaced electrodes and the field sensitive material being relatively disposed so that a field induced by the spaced electrodes is capable of affecting the field sensitive material, a first of the spaced electrodes including an impedance portion and a plurality of conductive, substantially low impedance portions connected to different electrical locations of the impedance portion and extending therefrom, first

terminal means connected to the impedance portion for applying an electrical signal thereto, a first capacitance electrically coupled with each of the conductive substantially low impedance portions, a second of the spaced electrodes including a conductive substantially low impedance portion, second terminal means connected to the second electrode for applying an electrical signal thereto, a second capacitance electrically coupled with the conductive substantially low impedance portion of the second electrode, and additional terminal means connected to the first and second capacitances for applying at least one electrical signal thereto.

4,493,532
PLEOCHROIC AZO DYES, A LIQUID CRYSTAL COMPOSITION CONTAINING THE AZO DYES AND A DISPLAY DEVICE USING THE LIQUID CRYSTAL COMPOSITION

Masaharu Kaneko, Kanagawa; Tetsuo Ozawa, Tokyo; Tomio Yoneyama, Kanagawa; Shuji Imazeki, Ibaraki; Akio Mukoh, Ibaraki, and Mikio Sato, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Mitsubishi Chemical Industries, Ltd., both of Tokyo, Japan

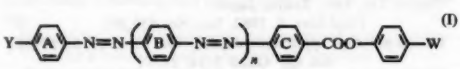
Filed Nov. 16, 1982, Ser. No. 442,057

Claims priority, application Japan, Nov. 16, 1981, 56-183366; Jan. 28, 1982, 57-12084; Feb. 10, 1982, 57-20130

Int. Cl.³ G02F *1/13;* **C09K** *3/34;* **C09B** *29/00, 31/00;* **C09F** *9/00*

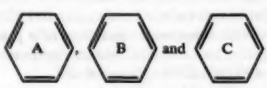
U.S. Cl. 350—349 **2 Claims**

1. A liquid crystal composition comprising a liquid crystal material selected from the group consisting of nematic liquid crystals, smectic liquid crystals and liquid crystals utilizing a cholesteric-nematic phase transition, and pleochroic azo dyes represented by the formula (I):



wherein Y represents alkoxy or

(wherein R^2 and R^3 each represents hydrogen, alkyl or alkoxyalkyl, and R^2 and R^3 may be connected to each other to form a nitrogen-containing ring together with the adjacent nitrogen); n represents 1 or 2; W represents alkyl containing 3 to 18 carbon atoms, alkoxyalkyl, cycloalkyl, aryl, cyano, halogen, acyloxy, carboxylic acid ester, and arylazo; and one of



represents a 1,4-naphthyl ring.

4,493,533
IMMERSION OIL CONTAINING ALIPHATIC THIO COMPOUNDS

Martin Petrzilka, Kaiseraugst; Inge Pracht, Rieben, and Urs Ruf, Biel-Benken, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 20, 1982, Ser. No. 370,120

Claims priority, application Switzerland, Apr. 27, 1981, 2730/81; Jan. 18, 1982, 272/82

Int. Cl.³ C07C *149/18;* **G02B** *1/04, 21/00;* **C10M** *3/32*

U.S. Cl. 350—418 **17 Claims**

1. In the combination for immersion oil optics of an immersion oil completely filling the space between the objective lens and a preparation or a cover glass over the preparation to be optically investigated, the improvement wherein the optical immersion oil comprises one or more aliphatic thio compounds of the formula

$$R^1O-(CH_2)_{n1}-S-(CH_2)_{m1}-OR^2 \qquad I$$

wherein R^1 denotes hydrogen, benzoyl or a group $-(CH_2)_{n2}-OR^3$ and R^2 denotes hydrogen or a group $-(CH_2)_{m2}-OR^4$, R^3 represents hydrogen or a group $-(CH_2)_{n3}-OH$ and R^4 represents hydrogen or a group $-(CH_2)_{m3}-OH$, the indices n_1, m_1, n_2, m_2, n_3 and m_3 signify whole numbers of 2 to 6 and the sums n_1+m_1 or n_2+m_2 or n_3+m_3 amount to at most 8,

or derivatives thereof in which one or more of the methylene groups is/are substituted by alkyl groups containing 1 to 4 carbon atoms.

4,493,534
FOCUS ADJUSTING DEVICE FOR CAMERA HAVING VARIFOCAL OPTICAL SYSTEM

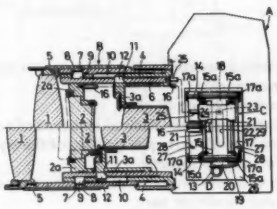
Makoto Ando, and Yukio Miki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1982, Ser. No. 351,958

Claims priority, application Japan, Mar. 6, 1981, 56-32703

Int. Cl.³ G02B *7/10, 7/11*

U.S. Cl. 350—429 **8 Claims**



1. A camera for use with a lens barrel including a varifocal optical system having an optical axis and a focal length and in which a focusing position for a subject at a given distance alters with a movement of first lenses for varying said focal length and in which a movement of second lenses for focusing varies with said focal length, said camera comprising:

a camera body having a front portion on which said lens barrel is attached; and

a focus adjusting device provided in said camera body, wherein said focus adjusting device includes;

focus coupling means coupled with said lens barrel and movable parallel to the optical axis of said varifocal optical system for moving said second lenses for focusing;

a pivotable member pivoted about a fixed pivot on said camera body for pivoting movement in a plane parallel to said optical axis and having an elongated focus guiding slot extending away from said fixed pivot;

a focus guiding member engaging said focus guiding slot and coupled with said focus coupling means to move therewith parallel to said optical axis;

focal length information transmitting means coupled with said lens barrel for moving said focus guiding member along said focus guiding slot in accordance with the focal length of said varifocal optical system to vary the distance from said fixed pivot to said focus guiding member; and

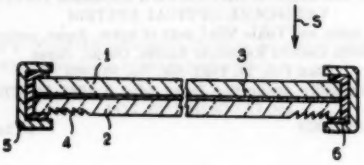
focusing means for pivoting said pivotable member to vary the inclination of said focus guiding slot in said plane parallel to said optical axis, the pivoting movement of said pivotable member causing movement of

said focus coupling means parallel to said optical axis through engagement of said focus guiding member with said focus guiding slot and through coupling of said focus guiding member with said focus coupling means, such that movement of said focus coupling means in the direction parallel to said optical axis is determined by the inclination of said focus guiding slot and the distance from said fixed pivot to said focus guiding member.

4,493,535
HYBRID TRANSMISSIVE FOCALIZING OPTICAL SYSTEM

André Champeau, 7 Rue Puvis-de-Chavannes, 75017 Paris, France

Filed Sep. 11, 1981, Ser. No. 301,447
Claims priority, application France, Sep. 12, 1980, 80 19768
Int. Cl.³ G02B 3/08, 5/22
U.S. Cl. 350—452 **9 Claims**



1. A hybrid transmissive focalizing optical system for a solar generator comprising:

a support part made of glass;

a focalizing part of the Fresnel lens type of a plastic material chosen from the group consisting of the styrene homopolymers and copolymers;

a frame structure provided at the periphery of said support part and focalizing part;

an intermediary layer of a transparent material provided between said support part and focalizing part, said intermediary layer having a thixotropic structure imparting a controlled viscosity without flowing and having adhesive properties with respect to said glass support part and said focalizing part, said intermediary layer comprised of:

a base material chosen from the group consisting of the silicones, polyolefines, paraffinic derivatives and the mixtures thereof, and

a low concentration of a micro-powdered agent for adjusting the viscosity thereof,

an ultraviolet absorbing substance in a concentration within the concentration of 0.5 to 6 percent by weight.

4,493,536
INVERTED TELEPHOTO TYPE LENS SYSTEM

Yoshinobu Kudo, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1982, Ser. No. 362,031
Claims priority, application Japan, Mar. 31, 1981, 56-48684
Int. Cl.³ G02B 9/60, 13/04
U.S. Cl. 350—462 **7 Claims**

1. An inverted telephoto lens system of a 5-component, 5-element type, comprising from the object to the image side:

a first component consisting of a negative meniscus single lens element convex to the object side;

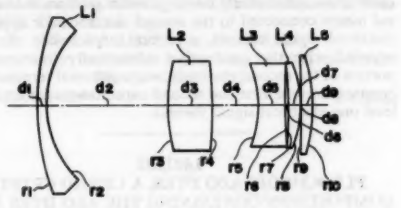
a second component consisting of a biconvex single lens element;

a third component consisting of a biconcave single lens element;

a fourth component consisting of a positive meniscus single lens element convex to the image side; and

a fifth component consisting of a positive single lens element,

wherein the lens system fulfills the following conditions:



$N_1 > 1.69$
$0.72(d_6 + d_7 + d_8 + d_9) < d_5 < 2.2(d_6 + d_7 + d_8 + d_9)$
$0.14\ f < d_5 < 0.3\ f$
$0.26\ f < d_4 < 0.43\ f$
$0.12\ f < d_3 < 0.4\ f$

wherein:

N_1 represents the refractive index of the material of the first component;

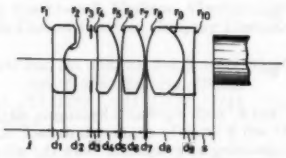
d_i represents the i-th axial distance counted from the object side; and

f represents the focal length of the whole lens system.

4,493,537
OBJECTIVE LENS SYSTEM FOR ENDOSCOPES

Kenichi Nakahashi, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,293
Claims priority, application Japan, Nov. 10, 1981, 56-179027
Int. Cl.³ G02B 9/34, 13/04
U.S. Cl. 350—469 **17 Claims**



1. An objective lens system for endoscopes comprising a first negative meniscus lens component having a concave surface on the image side, an aperture stop, a second positive meniscus lens component, a third biconvex lens component and a fourth positive cemented doublet component consisting of a positive lens element and a negative lens element, said lens system being so designed as to satisfy the following conditions:

$$n_1 \geqq 1.51 \quad (1)$$

$$\nu_1 \geqq 55 \quad (2)$$

$$1.4 \leqq f_{234}/f \leqq 1.7 \quad (3)$$

$$1.3 \leqq \left| \left(\frac{1 - n_1}{r_2} \right) / \left(\frac{1 - n_2}{r_3} + \frac{1 - n_3}{r_7} \right) \right| \leqq 1.6 \quad (4)$$

$$\nu_3 \geqq 60 \quad (5)$$

$$|n_4 - n_5| \geqq 0.2 \quad (6)$$

wherein the reference symbol f represents total focal length of the entire lens system as a whole, the reference symbol f_{234} designates total focal length of said second, third and fourth lens components as a whole, the reference symbols r_2, r_3 and r_7 denote radii of curvature on the image side surface of said

first lens component, image side surface of said second lens component and image side surface of said third lens component, the reference symbols n_1 through n_5 represent refractive indices of the respective lens elements and the reference symbols ν_1, ν_2 and ν_3 designate Abbe's numbers of said first, second and third lens components respectively.

4,493,538

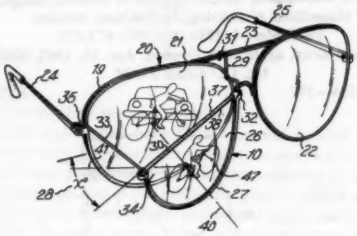
LATERAL VIEW EXTENDER DEVICE

Peter M. Tolliver, 42 Varinna Dr., Rochester, N.Y. 14618

Filed Sep. 24, 1982, Ser. No. 423,231

Int. Cl.³ G02C 7/08, 9/04

U.S. Cl. 351—57 **10 Claims**



5. An Homonymous Hemianopsia lateral view extender device for use with eyeglasses having a pair of lenses and a nose bridge separating said pair of lenses, said device comprising:

(a) a dichroic half lens having the combined optical properties of a reflector and a see through lens, and

(b) means for fixing said dichroic half lens to said nose bridge of said eyeglasses in optical registry with one lens of said pair of lenses for providing at least one optical path through said one lens of said pair of lenses and said dichroic half lens and at least one other path over said dichroic half lens,

(i) said dichroic lens being angularly disposed with said one lens of said pair of lenses to form an interior angle between said dichroic lens and said one lens of said pair of lenses for providing a lateral optical path intersecting said one optical path.

4,493,539

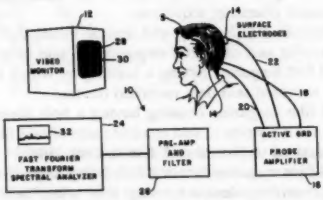
METHOD AND APPARATUS FOR OBJECTIVE DETERMINATION OF VISUAL CONTRAST SENSITIVITY FUNCTIONS

Mark W. Cannon, Jr., Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 30, 1982, Ser. No. 394,040

Int. Cl.³ A61B 3/10, 3/02

U.S. Cl. 351—205 **4 Claims**



4. Apparatus for objectively determining a visual contrast sensitivity function of a human subject, comprising:

(a) a video monitor for generating a sine wave grating pattern being flickered at a predetermined rate;

(b) means for detecting and recording a steady state Fourier spectrum of the brain wave activity of the human subject;

(c) means for adjusting said grating pattern through a plurality of spatial frequencies; and

(d) means for adjusting said grating pattern in contrast level at each spatial frequency in order to distinguish a visual evoked potential component of each recorded spectrum from noise contained therein and to identify a contrast threshold of each grating pattern of a particular spatial frequency corresponding to the contrast level at which said visual evoked potential component of said spectrum becomes indistinguishable from the noise therein, whereby the inverse of each contrast threshold may be plotted against its corresponding spatial frequency to yield the visual contrast sensitivity function of the human subject.

4,493,540

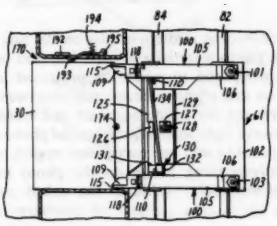
TRANSPORT APPARATUS FOR MICROFICHE CARDS

John E. Burbank, III, Ridgefield, and John R. Montgomery, Fairfield, both of Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1983, Ser. No. 474,538

Int. Cl.³ G03B 23/08

U.S. Cl. 353—122 **6 Claims**



1. In a microfiche card storage and retrieval system comprising a tray for receiving and storing in generally parallel position a plurality of cards and having a card transport device for moving preselected ones of said cards into and out of said storage means and for moving the cards along an XY axis in a predetermined plane to position the cards at a reading station, the improvement comprising:

load-unload station means positioned in the plane of movement of said card by said card-transport device, said load-unload station means comprising a chute having an inlet side adapted for receiving a card inserted therein by the operator, stop means for restricting the movement of the card through the chute, and means opposite said inlet side of said chute for guiding a microfiche card handled by said card transport means for directing a card into said chute from the opposite side.

4,493,541

APPARATUS FOR PHOTOGRAPHICALLY PRODUCING CHARACTERS OR OTHER REPRESENTATIONS

Fred A. Goetschi, Haus zum Anker, CH-6354 Vitznau, Switzerland

Division of Ser. No. 245,516, Mar. 19, 1981, Pat. No. 4,409,305. This application May 27, 1983, Ser. No. 499,082

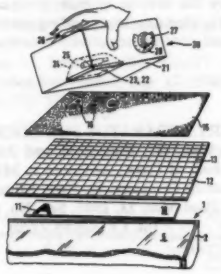
Claims priority, application European Pat. Off., Sep. 23, 1980, 105701.9

Int. Cl.³ G03B 27/04; G03D 5/00

U.S. Cl. 354—5 **23 Claims**

1. Apparatus for photographically producing characters or other representations under daylight conditions, such as title set, comprising photo material in sheet form which is generally insensitive with respect to daylight including blue light and having a predetermined sensitivity with respect to shortwave

light, a source of shortwave light, a developer liquid suitable for said photo material, a transparent cover film which is non-transmissive with respect to said developer liquid and a record carrier film which has at least one transparent region in the form of a character, symbol, picture, photo or other like representation surrounded by a ground which is opaque with respect to shortwave light to thereby provide a photostenciling implement, characterized by said photo material being wetted with said developing liquid and covered with said transparent cover film, of said record carrier film being relatively positioned on said cover film on the side thereof opposite to said photo material and such that said one transparent region is juxtaposed to where its projected image is to be produced on said photo material, said shortwave light source being positioned for irradiating said one transparent region with shortwave light so as to activate the photo material in the area juxtaposed to said one transparent region to thereby produce a corresponding image on the photo material which becomes immediately visible to the naked eye in daylight conditions.



4,493,542

PHOTOGRAPHIC CAMERA WITH HANDLE GRIP

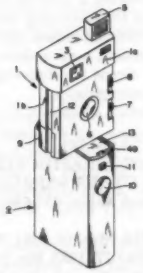
Hiroshi Ohmura; Atsuo Kohno; Minoru Shiiba, and Tsutomu Tanaka, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1983, Ser. No. 525,426

Claims priority, application Japan, Aug. 20, 1982, 57-143345; Aug. 20, 1982, 57-143347

Int. Cl.³ G03B *29/00, 17/02*

U.S. Cl. 354—82 **18 Claims**



1. A photographic camera comprising a flattened camera body containing means for forming an image; and a flattened handle grip rotatably coupled to the bottom of said fastened camera body, said flattened handle grip being in alignment with the flattened camera body when the camera in not in use and being rotatable out of alignment with the flattened camera body through an angle of about 90° relative to the flattened camera body so as to be disposed transverse to the flattened camera body when the camera is in use.

4,493,543

DEVICE FOR DATA RECORDING AT PHOTOGRAPHIC CAMERAS

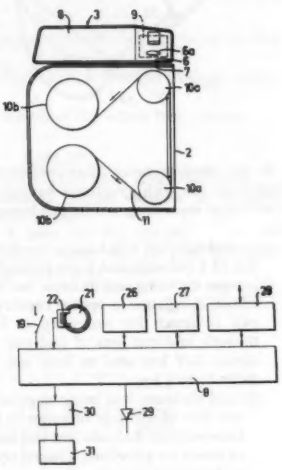
Jan A. Lundberg, Torslanda; Göran T. L. Wallgren, Onsala, and Mats H. Martinsson, Gothenburg, all of Sweden, assignors to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

Filed Mar. 4, 1983, Ser. No. 472,278

Claims priority, application Sweden, Apr. 14, 1982, 8202342

Int. Cl.³ G03B *17/24*

U.S. Cl. 354—109 **3 Claims**



1. In a camera including a camera body and a separate film magazine detachably attached to said camera body, the improvement comprising a device for recording data on the emulion side of a film operatively mounted in said film magazine, said device including:

(a) a housing;

(b) a microprocessor mounted in said housing and powered by a battery mounted in said housing;

(c) a character generator mounted in said housing and controlled by said microprocessor to generate preprogrammed character sequences;

(d) a hole in said housing and optical means for optically conveying said character sequences to said hole;

(e) said film magazine having a housing on which is detachably mounted said data recorded device;

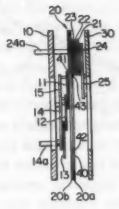
(f) said film magazine housing having a hole therethrough adjacent a portion of said emulsion side of said film where it is desired to record said data thereon; and

(g) said film magazine housing hole being aligned with said data recording device housing hole when said data recording device is mounted on said film magazine housing whereby actuation of said character generator results in characters generated thereby being recorded on said emulsion side of said film adjacent said hole in said film magazine housing.

4,493,544
FOCAL-PLANE SHUTTER

Kimio Uematsu, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,719
Claims priority, application Japan, May 20, 1982, 57-85454
Int. Cl.³ G03B 9/40
U.S. Cl. 354—246 8 Claims



1. A focal-plane shutter comprising:

(a) first and second base plates disposed parallel to each other with a predetermined space therebetween, each of said base plates being formed with an opening at a position opposed to that of the other base plate to define an exposure aperture having first and second edges, said first base plate having a recess facing said second base plate and located along said second edge of said aperture;

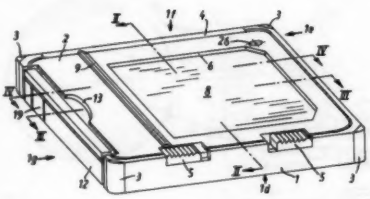
(b) light-shielding means located within said space between said base plates, said light-shielding means including at least one substantially flat plate-shaped blade member for closing said aperture over at least part of the area thereof; and

(c) drive means for moving said blade member along said base plates between an opening position in which the blade member is retracted outside said first edge of said aperture and a closing position in which said blade member is located across said aperture with part of said blade member juxtaposed with said recess.

4,493,545
FILM CASSETTE

Walter Bauer; Heinrich Färber, and Jürgen Müller, all of München, Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,435
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040819
Int. Cl.³ G03B 17/32
U.S. Cl. 354—277 44 Claims



1. A film cassette, particularly for sheet film, comprising:

(a) a pair of cooperating cassette portions movable between an open position and a closed position in which said cassette portions define a film compartment, one of said cassette portions having a supporting wall for the film and the other of said cassette portions having a window which is superimposed with said film compartment in said closed position;

(b) a hinge connecting said cassette portions for pivotal movement between said open and closed positions;

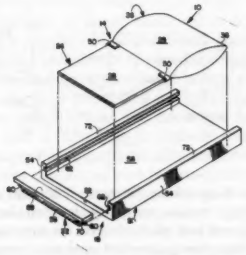
(c) a light-blocking member for said window receivable by said other cassette portion and designed to seal said film compartment against light; and

(d) a resilient rim projecting from said other cassette portion and having an end face which is directed towards said supporting wall in said closed position and is arranged to press the film against the same in such position, said rim extending around said window.

4,493,546
PROCESSING APPARATUS AND METHOD FOR TREATING A FILM UNIT WITH A LIQUID

David V. Cronin, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 7, 1983, Ser. No. 473,084
Int. Cl.³ G03D 9/00, 3/02
U.S. Cl. 354—324 24 Claims



1. Processing apparatus for treating a sheet-like film unit with a processing liquid, said apparatus comprising:

a liquid container having a compliant film unit receiving section and a communicating liquid reservoir section between which a volume of processing liquid, at least sufficient to have such a film unit immersed therein, is selectively distributed to establish a first condition whereby said receiving section is substantially dry and substantially all of the liquid is in said reservoir section and a second condition whereby said receiving section is flooded with liquid from said reservoir section to immersion treat such a film unit therein; and

pressure-applying means configured to act on the exterior of said compliant receiving section for selectively pressing portions of said receiving section against a wet immersion treated film unit therein to squeegee excess liquid from the film unit, said pressure-applying means also functioning to indirectly exert pressure on the liquid in said receiving section so the liquid flows into said reservoir section to change the distribution from said second condition to said first condition.

4,493,547
DATA RECORDING PHOTOGRAPHIC CAMERA

Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

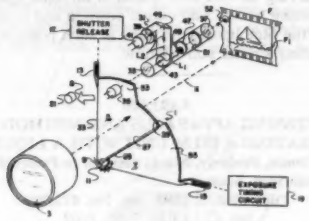
Filed Dec. 27, 1983, Ser. No. 565,317
Int. Cl.³ G03B 17/24
U.S. Cl. 354—424 5 Claims

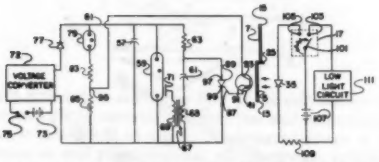
5. In a photographic camera of the type having (a) a data source for providing information relating to photographing a subject, (b) a light source for illuminating such information, (c) means for forming an illuminated image of the information on unexposed film in said camera to record the information on the film, (d) a shutter movable to initiate and terminate a film

exposure to photograph the subject, and (e) an electronic flash unit fireable to illuminate the subject, the improvement comprising:

photoelectric sensor means, responsive to incident light, for undergoing an electrical change;

means for directing light from said light source onto said photoelectric sensor means to cause said sensor means to undergo the electrical change;





light blocking means integral with said shutter, said light blocking means normally located between said light source and said photoelectric sensor means for preventing light from being directed onto said sensor means, though moving from between the two to permit light to be directed onto said sensor means as said shutter is moved to initiate a film exposure; and

means, responsive to said photoelectric sensor means undergoing the electrical change, for firing said flash unit.

4,493,548

APPARATUS FOR SUPPORTING FLEXIBLE MEMBERS

Antoun I. Ateya, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,435
Int. Cl.[3] G03G *15/20*
U.S. Cl. 355—3 FU 9 Claims

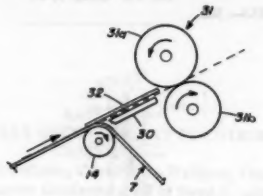
2. Apparatus for supporting a copy sheet carrying an unfused toner image which is subject to wrinkling as it is moved along a path to a fixing station, comprising:

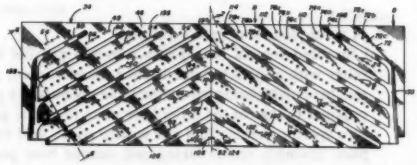
a support member located adjacent to said fixing station and having a surface extending along the path of movement of a copy sheet carrying an unfused toner image;

said support member having a plurality of passages with openings at said surfaces, said passages being arrayed in at least first and second rows (1) which are positioned with respect to each other on opposite sides across the width of said path, (2) which extend obliquely to said path, and (3) which diverge in the direction of said path, said respective passages of said first and second rows being oriented in an outward direction and in the direction of said path,

said support member further having at least (1) a first channel in said surface which is located along said path and which extends obliquely to said path and substantially parallel and adjacnet to said first row of passages and (2) a second channel in said surface which is located along said path and which extends obliquely to said path and substantially parallel and adjacent to said second row of passages, each of said channels having a curved edge adjacent to its respective row of passages, and

means for supplying a pressurized gaseous medium to said passages to effect a laminar flow of gaseous medium from said openings of said passages at said surface, along said surface and into said channels to be exhausted thereby outwardly with respect to said path, said flow of gaseous medium (1) supporting copy sheets of different sizes and





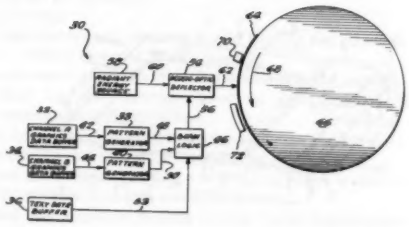
weights at a predetermined height above said surface; (2) tentering a supported sheet outwardly to prevent wrinkling and creasing thereof as it is moved along said path; and (3) delivering the leading edge of a supported sheet to a precise region of said fusing station.

4,493,549

OPTICAL SYSTEM FOR IMAGING AN ELECTROPHOTOGRAPHIC MEMBER

E. Raymond Thomas; Lysle D. Cahill, both of Dayton; John L. Tibbits, Centerville, all of Ohio; Kenneth D. Fraser, Scarboro, Canada; John F. Keane, Bellbrook, Ohio; Stanley C. Harting, Kettering, Ohio; George H. Kramer, Xenia, Ohio; Ronald J. Duke, Miamisburg, Ohio; Theodore A. Kessis, Dayton, Ohio; John C. Butler; Gary L. Frank, both of Centerville, Ohio, and John A. Lawson, Dayton, Ohio, assignors to Coulter Systems Corp., Bedford, Mass.

Division of Ser. No. 139,462, Apr. 11, 1980,. This application Oct. 4, 1983, Ser. No. 538,942
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 R 6 Claims



1. A optical system for imaging on electrostatically charged electrophotographic member across an image line to form on said member a latent electrostatic image of charged and discharged areas, the member thereafter being used as a printing plate, the system comprising:

source means for supplying a source beam of radiant energy;

splitter means for splitting a reference beam of radiant energy from said source beam;

modulator means receiving electrical signals and capable of deflecting individual rays of radiant energy from the source beam in response to said signals, the individual rays forming a fine beam;

focus means transmitting said fine beam and reference beam therethrough and providing respective objects thereof;

alignment means for aligning said fine beam and reference beam vertically, one above the other;

raster mirror means that oscillates from side to side around a vertical axis, said raster mirror means for receiving said reference and fine beams in a straight line and reflecting said beams in straight lines that are swept from side to side in respective planes, the plane described by said fine beam including said scan line on said member, said rays striking said charged member and forming said latent image;

lens system means arranged between said raster mirror means and said member and transmitting said reference and fine beams means to and from said raster mirror means, said lens system means providing field flattening of the reference and fine beams transmitted therethrough to maintain at least a focused image of said object of said fine beam on said member across the length of the scan line; and

folding mirror means for directing said reference and fine beams to said raster mirror means and lens system means along paths perpendicular to the center of said member and below said plane including said image line, and said plane in which said reference beam is swept being above said plane in which said fine beam is swept.

4,493,550

DEVELOPMENT APPARATUS OF LATENT ELECTROSTATIC IMAGES

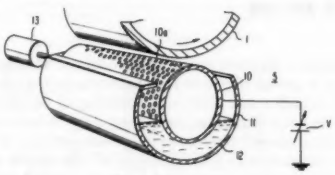
Yoshisuke Takekida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,647

Claims priority, application Japan, Apr. 6, 1982, 57-56992; Apr. 8, 1982, 57-58595; Apr. 8, 1982, 57-58596

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 **8 Claims**



1. A development apparatus of latent electrostatic images comprising, a drum of photosensitive material on which the latent electrostatic images are formed, a tank for accommodating an electrically conductive liquid developer, and an electrically conductive sleeve disposed rotatably within said tank and having a plurality of depressions formed and arrayed on its outer circumferential surface in a zig-zag matrix, said sleeve being disposed closely adjacent said photo-sensitive drum but spaced therefrom a predetermined distance.

4,493,551

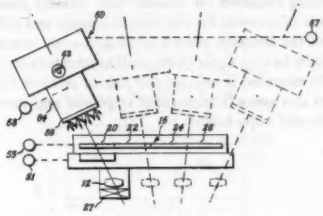
ILLUMINATION MEANS FOR 3-D PRINTING APPARATUS

Richard A. Fine, P.O. Box 6945, Marietta, Ga. 30065, and George F. Nason, III, 5568 Naylor Ct., Norcross, Ga. 30092

Filed Mar. 24, 1983, Ser. No. 478,325

Int. Cl.³ G03B *27/32, 35/14*

U.S. Cl. 355—22 **5 Claims**



1. In apparatus for printing stereoscopic picture of the type including a multiplicity of image bands, each of said image band comprising a plurality N of condensed image segments from a corresponding plurality N of two-dimensional views of an object field taken from spaced vantage points, and a lenticular print film having a corresponding multiplicity of lenticules aligned with the image bands, said apparatus comprising a projecting lens with a light gate in registry therewith, film holder means for positioning sequentially negatives in a negative film strip series containing said N two-dimensional views in said light gate, means for moving said lens at a preselected speed in a direction for projecting respective negatives from a corresponding plurality N of projecting lens locations with the projected image of a selected element of each negative in substantial registry with a reference point, and for stopping said lens at each said lens location for positioning a successive negative in said series in said light gate, and illumination means movable along a predetermined path for exposing at each lens location the respective negative in said light gate for projecting the negative onto a segment of an image band of the print film, the improvement wherein said illumination means comprises a tiltable lamphouse for directing illumination through a negative in said light gate and said lens onto the print film, and control means for tilting said lamphouse at predetermined varying angles that vary proportionately with the distance of said lamphouse from the center of scan of said print film.

4,493,552

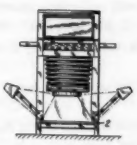
MODULAR PAGE COMPOSITION SYSTEM

Jack Walsh, 500 Pittsfield Rd., P.O. Box 1787, Lenox, Mass. 01240

Filed Mar. 28, 1983, Ser. No. 479,266

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **4 Claims**



1. Copy board for composing an assembly of translucent modules each bearing individual artwork thereon comprising a flat four sided plate of translucent material, means forming raised borders along two adjacent edges of said plate, means forming a first pair of spaced-apart parallel grooves in said plate, said grooves extending parallel to one raised border of

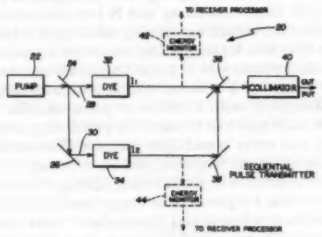
said plate each beginning at a point near the edge of a plate opposite to the other raised border thereof and extending a substantial distance toward said other border, means forming a second pair of spaced-apart parallel grooves in said plate, said second pair of grooves extending parallel to the other border of said plate each beginning at a point near the edge of the plate opposite to the one border thereof and extending a substantial distance toward said one border, a first guide having a pair of depending members on its underside, slidably mounted in said first pair of grooves for movement toward and away from one edge of the modules assembled in said copy board, and a second guide having a pair of depending members on its underside slidably mounted in said second pair of grooves for movement toward and away from another edge and said modules assembled on said copy board.

4,493,553

METHOD OF AND APPARATUS FOR MEASURING TEMPERATURE AND PRESSURE

Charles L. Korb, Potomac, and James E. Kalshoven, Jr., Laurel, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 28, 1982, Ser. No. 383,086
Int. Cl.³ G01J *5/58;* G01L *11/00*
U.S. Cl. 356—43 **31 Claims**



1. A remote atmospheric gas temperature measurement method, comprising the steps of:

generating a laser beam at a selected on-line wavelength of 12,999.95 wavenumbers wherein the gas exhibits relatively temperature sensitive and relatively pressure insensitive absorption characteristics;

transmitting said laser beam through a region containing the gas to be measured;

receiving said beam backscattered from at least two ranges;

measuring the energy of said received laser beam from said at least two ranges;

generating a second reference laser beam at a wavelength in the range of 13,000.50–13,001.50 wavenumbers whereat the gas exhibits a substantially non-absorption characteristic;

transmitting said second laser beam colinearly with said first laser beam;

receiving said second laser beam backscattered from said at least two ranges;

measuring the energy of said received second laser beam from said at least two ranges;

determining the fraction of beam energy absorbed by said gas between said at least two ranges using said energy measurements;

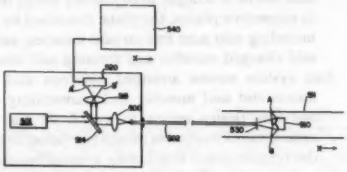
processing said determined fraction of beam energy absorbed to obtain a measurement of temperature between said at least two ranges.

4,493,554

METHOD AND APPARATUS FOR DETERMINING PHYSICAL CHARACTERISTICS OF OBJECTS AND OBJECT SURFACES

Timothy R. Pryor; Omer L. Hageniers; Walter J. Pastorius; Nicholas Liptay-Wagner, and Donald A. Clarke, all of Windsor, Canada, assignors to Diffracto, Windsor, Canada

Continuation of Ser. No. 15,792, Feb. 27, 1979, Pat. No. 4,305,661. This application Aug. 24, 1981, Ser. No. 295,577
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.³ G01N *21/17, 21/88;* G01B *11/30*
U.S. Cl. 356—241 **28 Claims**



1. A method for detecting defects in a bore surface comprising:

illuminating a circumference of a bore surface with light, said illumination being effected by directing light onto a curved mirror to concentrate light into an intense ring of light on the circumference of said bore surface; imaging the intense ring of light reflected from the circumference of said bore onto a circular photodetector array comprising a plurality of discrete photodetector elements, said elements being capable of generating output signals responsive to the intensity of light incident thereon, said imaging being effected with optical means comprising said curved mirror which collects reflected light from multiple angles;

scanning said circular array; and

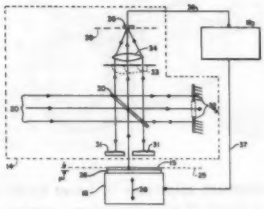
automatically analyzing the output of said array to detect defects in said bore surface.

4,493,555

HIGH SENSITIVITY FOCAL SENSOR FOR ELECTRON BEAM AND HIGH RESOLUTION OPTICAL LITHOGRAPHIC PRINTERS

George O. Reynolds, Waban, Mass., assignor to Honeywell Inc., Waltham, Mass.

Filed Sep. 22, 1982, Ser. No. 421,686
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—358 **11 Claims**



1. A three slit interferometric focusing device for use in combination with an optical projection system having a desired plane of best focus, said focusing device comprising:

A. a substantially coherent source of illumination;

B. an optical beamsplitter positioned in the path of the beam of said source of illumination, said beamsplitter operative

to produce a first beam in a first direction and a second beam in a second direction;

C. a first movable surface coupled for movement to a position of best focus which is at a first distance from said beamsplitter and which is oriented to receive said first beam, said position corresponding to the plane of best focus of said optical projection system;

D. means for moving said first surface to said position of best focus;

E. a substantially reflective second surface having an opening which is substantially at the center of said second surface, said second surface located a distance from said beamsplitter substantially equal to said first distance and said second surface oriented to receive said second beam;

F. an energy detection system capable of measurement at the wavelength of said source of illumination;

G. an optically absorbing third surface having an opening which is substantially at the center of said third surface, said third surface placed between said optical beamsplitter and said first movable surface in the path of said first beam so as to substantially absorb a portion of said first beam and so as to enable the remaining portion of said first beam to be received by said third surface; and

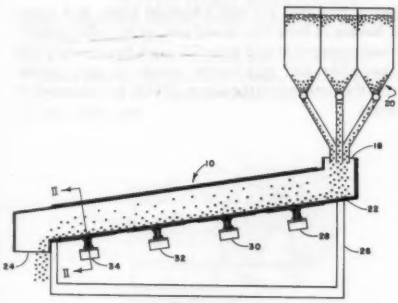
H. an optically opaque fourth surface with three substantially parallel slits, said fourth surface positioned between said optical beamsplitter and said energy detection system in order to pass a portion of said beam from said source to said detection system.

4,493,556

METHOD AND APPARATUS FOR MIXING PARTICULATE MATERIAL

Stanley R. Prew, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 18, 1983, Ser. No. 467,957
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—114 **11 Claims**



1. An apparatus for mixing particulate material comprising:

(a) a downwardly inclined trough structure having a pair of rigid opposed longitudinal side walls and a flexible floor member interposed between said side walls and said flexible floor member having an upper and a lower side;

(b) upper inlet means for superimposing a continuous, longitudinally flowing layer of particulate material over the upper side of said flexible floor member;

(c) lower outlet means for continuously removing particulate material from said trough structure;

(d) reans for repeatedly impacting a restricted area of the lower side of the flexible floor member with sufficient energy to cause particulate material in said layer to be projected upwardly so as to become airborne above said layer; and

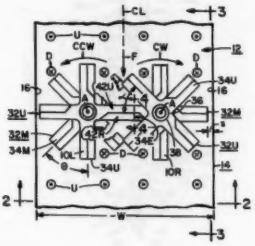
(e) means for directing said airborne particles in a transverse direction over said layer.

4,493,557

MIXING APPARATUS

Ashok L. Nayak, Corning, N.Y., and Paul F. Spremulli, Chapel Hill, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,355
Int. Cl.³ B01F *7/00*
U.S. Cl. 366—300 **16 Claims**



1. An apparatus for mixing viscous material comprising: at least one pair of stirrers, said stirrers located adjacent one another in closely spaced intermeshing relationship and being mounted for rotation about parallel axes in opposing sense to each other, each of said stirres including: a shaft; a plurality of blades mounted on the shaft in parallel axially spaced-apart relation with each other, each blade lying in a corresponding tier perpendicular to the shaft axis, each stirrer having the same number and spacing of blades as said adjacent stirrer, and the blades in each tier of one stirrer being aligned side-by-side in coplanar relation with the blades in corresponding tiers of the adjacent stirrer; each blade including a plurality of evenly spaced radially extending vanes lying within the plane of its blade, each vane having working surface means operatively engaging the viscous material for pumping and stirring the same upon rotation of the stirrer; the vanes of each blade being circumferentially offset from vanes on a blade in an adjacent tier, such that the vanes in adjacent tiers of each stirrer are angularly offset from each other about the axis of the stirrer, and the vanes of one blade being advanced by a predetermined angle relative to the vanes of an adjacent blade in the same tier so that all of said vanes of one blade intermesh with the vanes of such adjacent blade; and each coplanar blade being a structural mirror image of an adjacent blade, such that upon rotation of said stirrers, each working surface means pumps the viscous material in the same relative direction.

4,493,558

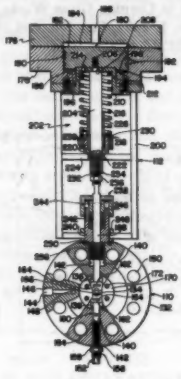
COMPENSATING VALVE SYSTEM FOR CONTROLLING ADJUSTABLE EMULSIFYING ORIFICE

Dannie B. Hudson, 15 Scott Dr., Morganville, N.J. 07751

Continuation-in-part of Ser. No. 386,193, Jun. 7, 1982,. This application Nov. 8, 1982, Ser. No. 439,931
Int. Cl.³ B01F *5/08*
U.S. Cl. 366—341 **18 Claims**

1. An apparatus for homogenizing a pair of fluid components within a conduit having upstream and downstream sides, at least one of said components comprising a hydrocarbon fuel, said apparatus comprising orifice means arranged within said conduit between said upstream sides for providing an adjustable orifice within a stream of said hydrocarbon fuel, said orifice means comprising a pair of spaced-apart elements defining an opening therebetween for homogenizing said pair of fluid components, and adjusting means in operative association with at least one of said pair of elements for continuously

varying the size of said opening for controlling the pressure of the homogenized pair of fluid components within the down-



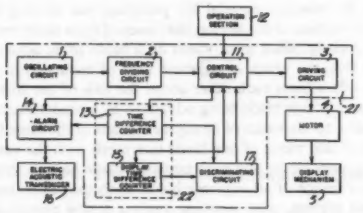
stream side of said conduit in response to downstream pressure changes thereof.

4,493,559

ANALOGUE ALARM ELECTRONIC TIMEPIECE

Takashi Ishida, and Masaharu Shida, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Feb. 7, 1980, Ser. No. 369,312
Claims priority, application Japan, Feb. 9, 1979, 54-13985
Int. Cl.³ G04B *23/02, 19/04*
U.S. Cl. 368—74 **4 Claims**



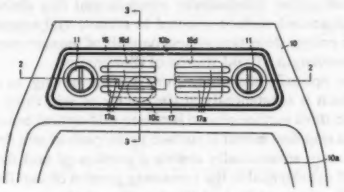
1. An analogue alarm electronic timepiece comprising: a motor; a driving circuit for applying drive signals to said motor for driving said motor; an operation section having switch means for setting an alarm time and a present time and for producing corresponding time signals; control means for receiving the time signals from said operation section and accordingly controlling the drive signals applied to said driving circuit; display means including a movable display member driven by said motor for indicating said alarm time and said present time; first means for counting and storing a count value representative of the difference between said present time and said alarm time under control of said control means; second means for counting and storing a count value representative of the difference between said present time and the display time indicated by said display member under control of said control means; first detecting means connected to said first means for detecting the difference between said present time and said alarm time and for producing a coincidence signal when the difference is zero; second detecting means connected to said second means for detecting the difference between said present and said display time; and an electronic acoustic transducer operative in response to the coincidence signal produced by said first detecting means for producing an alarm sound.

4,493,560

ACOUSTIC ALARM DEVICE FOR WATCHES

Satoru Fukutome; Hideo Hatanaka, and Motoyuki Saito, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 164,769, Jun. 30, 1980, Pat. No. 4,351,041.
This application Jun. 28, 1982, Ser. No. 392,637
Claims priority, application Japan, Jun. 30, 1979, 54-89820; Jun. 30, 1979, 54-89821; Jun. 30, 1979, 54-89822
Int. Cl.³ G04C *23/02, 21/16*
U.S. Cl. 368—88 **1 Claim**



1. In an alarm device for a watch including a watch case, a vibration plate for producing an alarm sound, and a watertight sealing packing for maintaining the inside of said vibration plate in a watertight state, the improvement which comprises:

a recess provided in an upper portion of the body of said watch case, said recess containing holes provided in the bottom thereof, threaded pipes fixedly disposed in said holes, each of said threaded pipes projecting from the bottom thereof, said watertight sealing packing being engaged with said recess and provided with holes for receiving the projected portion of said threaded pipes and said vibration plate being engaged with said watertight sealing packing and disposed adjacent to the bottom of said recess,

cover means provided for said vibration plate, said cover means having at least one sound emanating hole; and

screw means engaged in said threaded pipes for securing said vibration plate and said cover means to said recess, whereby the entirety of the alarm device is embedded in said recess.

4,493,561

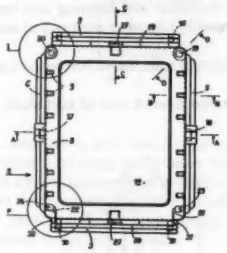
REVERSIBLE WRIST WATCH

Jean Bouchet, Troinex, Switzerland, assignor to Bouchet-Lassale S.A., Geneva, Switzerland

Filed Apr. 19, 1983, Ser. No. 486,305
Claims priority, application Switzerland, May 11, 1982, 2923/82
Int. Cl.³ A44C *5/00*; G04B *37/00*
U.S. Cl. 368—281 **10 Claims**

1. Reversible wrist watch, comprising a watch case made of two parts fixed one to the other and constituting each one of the faces of the reversible watch; means pivotally mounting the case along its six o'clock-noon axis on two bars perpendicular

to said axis each of which bars receives one end of a watch strap; the case comprising two lateral covers hinged each at



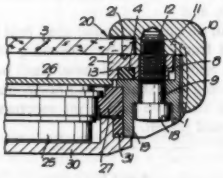
one of their ends to the case, said covers covering in service position the lateral edges of the watch case.

4,493,562

WATER TIGHT WATCH-CASE

Gaston Gagnebin, Bienne, Switzerland, assignor to Omega SA, Bienne, Switzerland

Filed Apr. 5, 1983, Ser. No. 482,376
Claims priority, application France, Apr. 13, 1982, 82 06703
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—294 **7 Claims**



1. A water tight watch case comprising:

a case band;

an annularly-shaped flange superposed onto the case band and a watch glass supported by the flange and extending across an opening of the annularly-shaped flange;

at least two claws each having a generally L-shape with a first leg of the L being positioned over and adjacent an upper surface of the watch glass and the second leg extending downwardly along the case band, the first leg of each claw being provided with a threaded portion adapted to fit into an opening provided in the watch glass; and,

for each claw a screw passing through an opening in said watch band to mesh with said threaded portion of said first leg inside the general outer periphery of said watch glass;

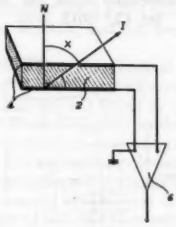
thereby to assure the fixing of the watch glass to the watch case.

4,493,563

PYROELECTRIC DETECTOR

Jean C. Peuzin, Eybens, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 3, 1982, Ser. No. 354,246
Claims priority, application France, Mar. 13, 1981, 81 05059
Int. Cl.³ G01J *5/02, 5/10, 5/48;* G01K *7/32*
U.S. Cl. 374—121 **6 Claims**



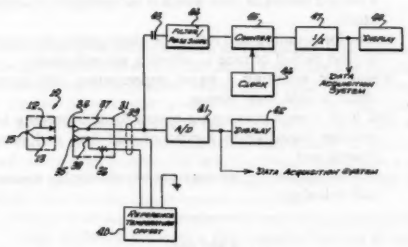
1. A pyroelectric detector with an optimized quality factor, comprising a dielectric material inserted between two parallel electrodes of a class other than (1) and m, the material being a monodomain ferroelectric monocrystal, the faces of the monocrystal in contact with the electrodes being inclined towards the polar axis of the monocrystal, the quality factor being the ratio $p/\epsilon C$, in which p is the pyroelectric coefficient of the dielectric material of the detector, ϵ is the principal dielectric permittivity along the polar axis of the material and C is the calorific capacity of the material, the perpendicular line to the faces of the monocrystal in contact with the electrodes being substantially contained in the plane of the major axes 1 and 3 and the angle X between said perpendicular line and the polar axis of the monocrystal being determined as a function of a parameter A equal to ϵ_1/ϵ_3, ϵ_1 and ϵ_3 respectively representing the minimum major dielectric permittivities of the dielectric material and respectively corresponding to major axes 1 and 3.

4,493,564

CLINICAL INSTRUMENT FOR MEASURING PULSE RATE AND BODY TEMPERATURE

Saul Epstein, 14558 Deervale Pl., Sherman Oaks, Calif. 91403

Filed Sep. 27, 1982, Ser. No. 424,602
Int. Cl.³ H01L *35/00;* A61B *5/02*
U.S. Cl. 374—179 **9 Claims**



1. A clinical instrument for measuring the pulse rate and body temperature of a patient which comprises:

(a) a sensor for sensing the temperature of tissue said sensor having an electrical output with a DC component responsive to the average temperature of said tissue and an AC component responsive to pulses of blood;

(b) means responsive to the DC component of the output of said sensor for providing an output representative of the temperature being sensed; and

(c) means responsive to the AC component of the output of

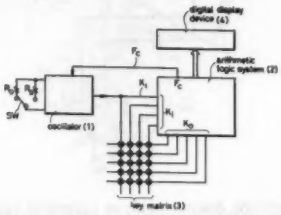
said sensor for providing an output representative of the pulse rate of said patient.

4,493,565

COMBINED THERMOMETER AND CALCULATOR

Masakazu Saka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1982, Ser. No. 400,265
Claims priority, application Japan, Jul. 28, 1981, 56-118772
Int. Cl.³ G01K 7/00
U.S. Cl. 374—185 **3 Claims**



1. A combined electronic thermometer and calculator device, comprising:

an electronic calculator comprising key matrix input means, key signal input terminals for receiving key signals from said key matrix input means, logic means for performing arithmetic operations with data input via said input terminals, and display means for displaying the results of said arithmetic operations;

said device further comprising:

oscillating means for providing a first waveform signal at a first frequency dependent upon temperature;

dividing means for dividing said first waveform signal for providing a second waveform signal of a second frequency for defining a first period of time dependent upon temperature;

means for generating reference clock pulses at a third frequency which is greater than said second frequency;

means for counting said reference clock pulses during said first period of time to obtain a first count;

means for inputting a signal representing said first count of said clock pulses to said logic means;

means for generating a third waveform signal for defining a second period of time which is independent of temperature;

means for counting said reference clock pulses during said second period of time to obtain a second count;

means for inputting a signal representing said second count to said logic means;

said logic means comprising means for determining temperature based upon a ratio of said first and second counts; and

means for displaying temperature in said display means of said calculator.

4,493,566

FRONT TO BACK ADJUSTMENT FOR CARRIAGE ASSEMBLY

Ronald G. McMahon, and Donnie E. Hale, both of Garland, Tex., assignors to Contitronix, Inc., Garland, Tex.

Filed Jun. 10, 1982, Ser. No. 387,156
Int. Cl.³ B41J 11/20
U.S. Cl. 400—59 **1 Claim**

1. Apparatus for adjusting the relative position of a print mechanism to a platen on a printer frame comprising:

a. first and second parallel supports mounted to a printer frame in spaced apart relationship parallel to said platen,

b. a pulley support assembly mounted on one of said supports for movement parallel to said supports,

c. a bearing assembly slidably mounted on the other of said supports,

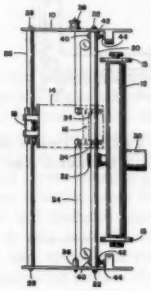
d. a carriage assembly for carrying a print mechanism thereon, said carriage assembly being mounted to said pulley support assembly and slidably attached to said bearing assembly to allow movement of said print mechanism towards or away from said bearing assembly while maintaining contact with said bearing,

e. an elongated cylindrical shaft extending from one side of said frame to the other and forming said one support,

f. means for releasably fastening each end of said shaft to said frame,

g. a horizontal slot in said frame for receiving each end of said shaft,

h. a threaded orifice in each end of said shaft,



i. a bolt passing through each slot for mating with each threaded orifice whereby tightening said bolts fastens each end of said shaft to said frame in a corresponding slot,

j. a bolt extending horizontally through said shaft in a direction perpendicular to said shaft's longitudinal axis,

k. an orifice in said frame for receiving said horizontal shaft bolt,

l. a first nut on said horizontal shaft bolt for locking said bolt to said shaft, and

m. a second nut on said horizontal shaft bolt for locking said bolt to said frame whereby loosening of said first and second nuts allows said horizontal shaft bolt to be turned thereby moving said shaft in said horizontal slot in a horizontal plane to move said print mechanism toward or away from said platen.

4,493,567

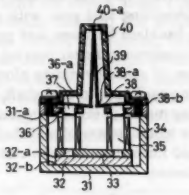
IMPACT DOT PRINTING HEAD

Ikuo Tada, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 323,032
Claims priority, application Japan, Nov. 19, 1980, 55-165507
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 **4 Claims**

1. An impact dot printing head comprising a permanent magnet formed into a generally disc shape from a material having a high energy product and arranged as a part of a common magnetic path of a plurality of magnetic circuits; a plurality of magnetic cores having coils wound thereon; an inner yoke contacting said cores, one pole side of said permanent magnet being coupled to a lower part of said inner yoke; an outer yoke substantially cup-shaped, the other pole side of said permanent magnet being coupled to an inner bottom surface of said outer yoke; an upper yoke coupled to an edge of the wall of said outer yoke and provided with openings in its positions aligned with said cores, elastic members fixed at their

ends; armatures fastened to said elastic members and rockably fitted in said openings of said upper yoke; and printing projections fixed to fore end parts of said elastic members; said armatures being attracted to said cores against said elastic members by magnetic fluxes of said permanent magnet through said



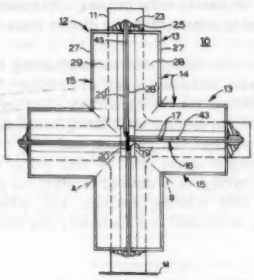
inner yoke, said cores, said outer yoke and said upper yoke; whereby during a printing operation a respective coil can be energized to cancel some of the magnetic flux of said permanent magnet and release the corresponding elastic member thereby to protrude the corresponding printing projection outwardly from the printing head.

4,493,568

DOT MATRIX PRINTHEAD EMPLOYING MOVING COILS

David A. Estabrooks, 6 Abbot Bridge Rd., Andover, Mass. 01810

Filed Feb. 22, 1983, Ser. No. 447,486
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **26 Claims**



1. A dot matrix electromagnetic printing apparatus movable across a paper web supported by a platen comprising:

a plurality of elongated rectangular-shaped print wire actuators;

a print wire connected to each of said actuators, said print wire having a printing tip portion projecting beyond a first end of said actuator;

each of said print wire actuators including a rectangular-shaped current energizable coil for movement of said actuator in a first direction perpendicular to a corresponding magnetic field upon energization of said coil;

a support base;

a magnetic assembly comprising a plurality of magnetic element sets cooperating with said actuators each element set having a plurality of magnetic elements and being mounted on said support base;

selected ones of the elements of each of said element sets being spaced from each other to provide said magnetic field in a pair of thin elongated flux gaps therebetween for containing opposing sides of the coil of at least one of said print wire actuators;

said element sets being arranged for aligning each of said printing tip portions adjacent to one another and along at least one imaginary line;

said printing tip impacting a print position due to movement in said first direction, and said actuator moving in a second direction to return to a non-print position;

each of said actuators including means for supporting each of said actuators for movement of said printing tip portions in said first and second directions and for sustaining said impact at said print position;

each of said actuators being a thin elongated, planar rectangular shaped member, said coil being flat and generally rectangular;

said coil comprising two longitudinal coil portions, each of said coil portions arranged adjacent to the longitudinal sides of the actuator and linked by the magnetic flux path of said pole faces of opposite polarity;

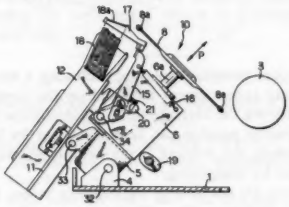
each magnetic element set comprising at least one permanent magnet and first and second pole pieces each having a first face of a large surface area engaging the pole faces of the permanent magnet, the free end faces of the pole pieces perpendicular to said first face being positioned adjacent to the longitudinal side portions of the coil and being thin and having a small surface area to concentrate the magnetic flux in said pole pieces to said thin elongated flux gaps.

4,493,569

TYPE WHEEL CHANGING MECHANISM IN A PRINTER

Hiroshi Kawahara, and Kazuo Nakamura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 5, 1981, Ser. No. 290,301
Claims priority, application Japan, Aug. 11, 1980, 55-113603[U]
Int. Cl.³ B41J *1/24*
U.S. Cl. 400—144.2 **13 Claims**



1. A printer including a platen and a printing head which are movable relative to each other along a printing line on which characters are to be printed, said printing head having thereon: an electric drive motor; a rotor shaft rotated by said electric drive motor; a daisy-shaped type wheel which is mounted on one end of, and mountable and removable axially of, said rotor shaft; and a print hammer for striking toward said platen a type element selectively located at a printing position on said type wheel, wherein the improvement comprises:

printing head supporting means for supporting said printing head pivotally between a first position thereof at which said printing head is permitted to perform a printing operation, and a second position thereof at which said type wheel is mountable and removable;

printing head biasing means for biasing said printing head toward said second position thereof;

a manual member;

locking means for holding said printing head at said first position thereof against the biasing force of said printing head biasing means, said locking means being released by the operation of said manual member to permit said printing head to pivot to said second position thereof;

ribbon holding means, supported by said printing head, for

supporting and guiding an active portion of an inked ribbon between said selectively located type element and said platen; and

ribbon lifting means for operatively connecting said ribbon holding means to said printing head to move said ribbon holding means, in response to the pivoting movement of said printing head from said first position to said second position under the biasing force of said printing head biasing means, so as to put said active portion of said inked ribbon out of a path taken by said type wheel when mounted or removed.

4,493,570

CONTROL SYSTEM FOR IMPACT PRINTER

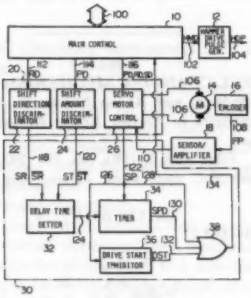
Shigeyuki Araki, Komae, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 4, 1982, Ser. No. 432,622

Claims priority, application Japan, Oct. 14, 1981, 56-162802; Nov. 2, 1981, 56-174476

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **11 Claims**



1. An impact printing apparatus including a movable carriage, a rotary type element mounted on the carriage, drive means for driving the carriage to and stopping the carriage at a desired printing position and hammer means for hammering the type element for printing at the desired printing position, characterized by comprising:

delay means for controlling the hammer means to hammer the type element at the expiration of a variable delay time which begins when the carriage has been driven to the desired printing position by the drive means; and

control means responsive to a distance of movement of the carriage from a previous position to the desired printing position and setting the delay time of the delay means in accordance with a predetermined function thereof.

4,493,571

PRINT GUIDE MECHANISM

John T. Potter, Locust Valley, N.Y., assignor to Iquad Company Incorporated, Locust Valley, N.Y.

Continuation-in-part of Ser. No. 310,189, Oct. 9, 1981, Pat. No. 4,440,038, and a continuation-in-part of Ser. No. 407,841, Aug. 13, 1982, Pat. No. 4,423,970, which is a continuation of Ser. No. 190,680, Sep. 24, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 476,666

Int. Cl.³ B41J *1/30*; F16H *55/18*

U.S. Cl. 400—144.2 **25 Claims**

1. A print guide mechanism comprising:

a rotary print element;

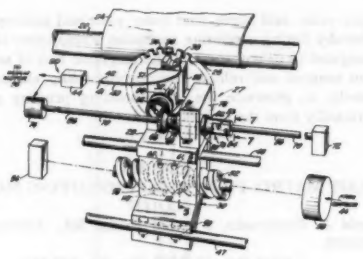
a right-angle drive for imparting rotation to said rotary print element for the selection of a character to be printed by a type section of said element;

a carriage for carrying said rotary print element in a direction transverse to a medium receiving the printing by said print element;

a shaft having longitudinal groove means extending transversely of said printing medium, said right-angle drive comprising a gear slidably disposed about said shaft for rotation therewith, said mechanism further comprising key means connecting said gear with said groove means for inhibiting backlash between said gear and said shaft;

said key means comprising linear bearing means for permitting translation of said key means along said shaft, rotationally locking said gear to said shaft;

said linear bearing means of said key means including screws angled relative to a diameter of said shaft for directing ball bearings to said linear bearing into contact with edges of said groove means;



means for rotating said shaft to a designated position for selection of a character to be printed, said rotation means being disposed at a stationary site distant from said movable carriage;

worm means for translating said carriage along said shaft, said worm means including a pair of beveled rollers carried by said carriage for mating with inclined surfaces of a worm of said worm means for inhibiting backlash between said worm means and said carriage; and

means for rotating a worm gear of said worm means to advance said carriage to a desired position for printing a character on said printing medium, and wherein said rotating means is located at a stationary site distant from said carriage.

4,493,572

LONG-LIFE INKED-RIBBON CASSETTE

William G. Van Ocker, Philadelphia; Ivan Pawlenko, Levittown; Donald F. Reider, Philadelphia; Charles J. Troebs, Philadelphia; Robert A. Clair, Philadelphia, and Stanley C. Crandall, Holland, all of Pa., assignors to Avery International Corp., Pasadena, Calif.

Filed Dec. 2, 1982, Ser. No. 446,249

Int. Cl.³ B41J *32/02, 31/16*

U.S. Cl. 400—196.1 **11 Claims**

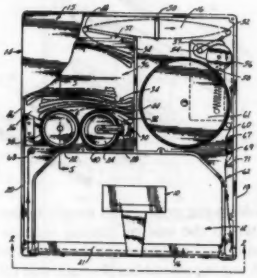
1. An inking cassette for use in a vertical position with an imprinter printing head having a line of travel, said inking cassette comprising:

a housing including a storage chamber for fan-folded, inked ribbon and an adjacent inking means adapted to be positioned above the printing head, said storage chamber having a lower and an upper end with an inlet being located at the lower end and an outlet being located at the upper end, a first leg extending downward from said inking means, and a second leg extending downward from said storage chamber, said first and second legs being arranged to be disposed on opposed sides of the printing head;

a continuous length of inked ribbon disposed in the housing

and passing from said first leg to said second leg for movement in a horizontal direction beneath the printing head;

a pair of cooperating nip rollers at the lower end of the storage chamber, said nip rollers having parallel, horizontally disposed axes when said cassette is in the vertical use position, each nip roller providing a textured elastomeric surface and engaging the ribbon therebetween, the rollers adapted to circulate the ribbon along a path from the first leg past the printing head to the second leg, upwards through the nip rollers, fan-folding said ribbon in said storage chamber and causing said ribbon to be removed from the storage chamber, inked by said inking means and back to said first leg, the storage chamber disposed vertically above the nip rollers when the cassette is vertically oriented for use with the printing head, the storage chamber containing a length of said ribbon in a fan-folded ribbon pack extending from the nip rollers to a position above the nip rollers and below the upper end of the storage chamber, to provide a head of ribbon weighing atop the nip rollers, and a dispensing pin providing a drag at an outlet at the upper end of said storage chamber;



a pair of dams positioned to contact opposed edges of the ribbon as the ribbon leaves the storage chamber, to prevent folds of the inked ribbon from passing together outwardly from said storage chamber over said dispensing pin; and

means to functionally amplify the drag on the ribbon between the dispensing pin and an end of the first leg to cause said ribbon to be taut when drawn by said nip rollers from said first leg to said second leg.

4,493,573

PRINTING APPARATUS

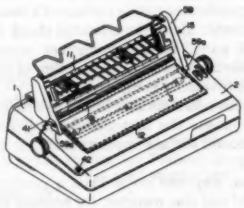
Masanori Hashimoto, Yokohama, and Shunichi Ogawa, Hatano, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 17, 1983, Ser. No. 476,222

Claims priority, application Japan, Mar. 19, 1982, 57-42831; Mar. 26, 1982, 57-41841

Int. Cl.³ B41J *13/14, 29/10*

U.S. Cl. 400—647.1 **4 Claims**



1. A printing apparatus comprising:

a printer body;

an upper cover secured to said printer body;

a front cover attached to the printer body by hinged portions on opposite sides of the front cover in a position forwardly of said upper cover and movable between an open position and closed position;

a platen interposed between said upper cover and said front cover;

means to selectively mount one or more of a group of components including a sound absorber, a printing sheet guide, a noise silencing cover and a page feeder;

a pair of brackets each removably inserted in one of two engaging holes formed on opposite sides of said upper cover, each of said brackets having a first engaging portion located on an inner side of said bracket and a second engaging portion located on an outer side of said bracket;

said sound absorber detachably inserted along said platen;

said printing sheet guide releasably brought into engagement at corners on opposite sides with said first engaging portions of said brackets so that the printing sheet guide can be set in a predetermined position or brought to a lying position when not in use;

said noise silencing cover releasably brought into engagement at forward ends of arms located on opposite sides of said noise silencing cover with said second engaging portions of said brackets to thereby cover a printing section in a manner to be freely opened and closed; and

said page feeder including engaging portions located on opposite sides of said page feeder which are inserted in positions at the front cover outwardly of the sound absorber and the noise silencing cover and inwardly of said hinged portions in such a manner that said engaging portions are releasably brought into engagment with a shaft of said platen;

wherein said components to be optionally mounted on the printing apparatus can be mounted either singly or plurally in any arbitrarily selected combination as desired, and the front cover can be brought to an open position without removing the optionally mounted component or components for replacing a ribbon or a printing wheel with a new one.

4,493,574

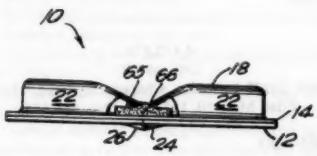
DISPENSER PACKAGE HAVING FAULT LINE PROTRUSION

Sanford Redmond, 1385 York Ave., New York, N.Y. 10021, and Walter A. Mainberger, Wayne, N.J., assignors to Sanford Redmond, New York, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,813

Int. Cl.³ A47L *13/17*

U.S. Cl. 401—132 **16 Claims**



1. A dispensing package for a flowable substance, said package including a relatively stiff substantially flat sheet and flexible sheet secured to one face of said relatively stiff substantially flat sheet, said flexible sheet forming a pocket adjacent said one face of said relatively stiff substantially flat sheet for containing a flowable substance, said relatively stiff substantially flat sheet having a fault line of predetermined length, protrusion means displacing at least a portion of said fault line out of the plane of said relatively stiff substantially flat sheet in a direction away from said one face for substantially maximally increasing the stress in said relatively stiff substantially flat sheet at the dis-

placed portion of said fault line, whereby upon bending said relatively stiff substantially flat sheet into a "V" about an axis extending along said fault line so that the arms of said "V" encapture said pocket, said fault line initially ruptures at the locus of said protrusion means to create at least one opening through which said flowable substance is dispensed in a directed flow, said protrusion means having a configuration which is substantially symmetrical on either side of said fault line and on either side of an axis normal to said fault line and in which the point of greatest displacement is located substantially on said fault line.

4,493,575

RELEASABLE PROTECTIVE HOLDER FOR A WRITING IMPLEMENT

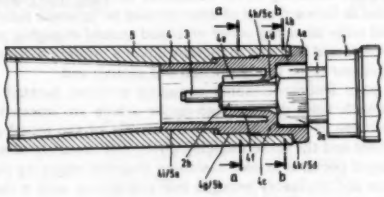
Otto Mutschler, Ludolf-Krehl-Strasse 12, 6900 Heidelberg, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 437,104

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 8136741

Int. Cl.³ B43K *13/00*

U.S. Cl. 401—195 **4 Claims**



1. A releasable protective holder for a tip of a writing or drafting implement including a polygonal part, a cylindrical part extending therefrom and a writing or drafting tube on the cylindrical part extending into the holder when the implement tip is held therein, the holder comprising

(a) a first receiving portion of a polygonal cross section keyed to the polygonal part, the first receiving portion including

(1) an annular bottom wall engaging an end face of the polygonal implement tip part, and

(b) a second, tubular receiving portion extending from the annular bottom wall of the first receiving portion to a free end thereof, the tubular receiving portion yieldingly surrounding the cylindrical part of the implement tip and defining

(1) a bore having at the free end of the bore a diameter smaller than the diameter of the cylindrical part for releasably clamping the implement tip in the protective holder.

4,493,576

OIL MOP

Jay Y. Suhh, 20125 Labrador, Chatsworth, Calif. 91311

Filed Mar. 10, 1983, Ser. No. 458,656

Int. Cl.³ A46B *11/04*

U.S. Cl. 401—283 **3 Claims**

1. An oil mop comprising in combination:

a. a rod frame formed of individual rods;

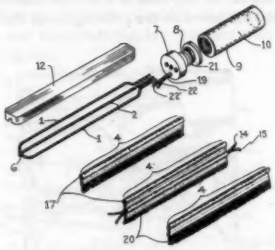
b. a hollow handle and ferrule assembly accommmodating one end of the rods of said rod frame and containing a wick filled tube;

c. single pouch wiping assemblies made up of oil insaturable, polymeric cloth panels with sewed-in saturable cord segments and incorporating one pouch for mounting on said rod frame;

d. double pouch wiping assemblies made up of oil insaturable polymeric cloth panels with sewed-in saturable cord segments and containing two pouches permitting the mounting on said rod frame and the containment of nonsaturable oil transmitting cords in and around the second pouch;

e. oil insaturable polymeric batting packed within the spaces between the mounted wiping assemblies to form an oil storing volume fed by a wick connecting a primary oil supply in the said hollow handle to the oil storing volume through said wick filled tube;

f. an oil resistant flexible cover drawn over the mounted single and double pouch wiping assemblies to prevent oil seepage from the top of the assembled mop and to serve as an auxiliary mop handle;



whereby oil from the primary oil supply in the hollow handle is drawn to the said oil storing volume by capillary action of said wick and hence to the second pouches of the two pouch wiping assemblies through said oil transmitting cords and finally to the saturable cord segments from where it can be brushed onto a surface being cleaned and produce, as it leaves the saturable cord segments, a concentration gradient which draws replacement oil from said oil storing volume, wicks and primary oil supply.

4,493,577

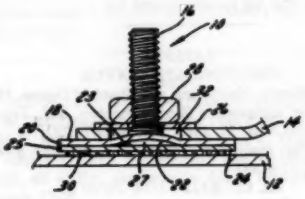
DOUBLE DISC STUD ASSEMBLY FOR THIN WALLED PANELS

Frank J. Cosenza, San Pedro, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Aug. 20, 1982, Ser. No. 410,096

Int. Cl.³ F16B *5/02*

U.S. Cl. 403—41 **2 Claims**



1. In a stud assembly of the type having a threaded shank fixedly attached perpendicular to one surface of a base member and a nut means rotatable along the threaded shank for securing a nonstructural panel to an attachment whereby the threaded shank is insertable through an aperture in the attachment device, the improvement comprises:

a disc member having a first surface joined to a surface of the base member opposite the first-mentioned base member surface, and a second surface opposite said first disc member surface; and

an adhesive means, disposed on at least a portion of said second surface of said disc member, for holding and securing the stud assembly to the nonstructural panel, with said disc member and the base member being joined at adjacent

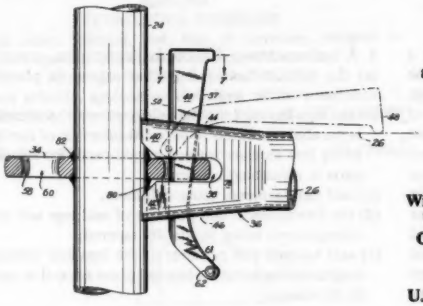
peripheries in a manner allowing a portion of the base member to resiliently, deform apart from said disc member and the nonstructural panel when the nut means is rotated to cause movement of the shank in an axial direction away from the nonstructural panel.

4,493,578

SCAFFOLDING CONNECTOR AND SYSTEM

Michael S. D'Alessio, Flushing, N.Y., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Sep. 30, 1982, Ser. No. 431,115
Int. Cl.³ F16B 7/00
U.S. Cl. 403—49 **22 Claims**



1. A scaffolding connector positioned at one end of a scaffolding cross-member and adapted to engage a bracket affixed to a scaffolding post and to be fastened to said bracket and against the convex surface of said post by a wedge inserted through a cutout in said bracket, said connector comprising being integrally formed from one end of a tubular member with a longitudinally extending cross-slot in said end of a width and depth to accommodate said bracket therein, said slot dividing said end into an upper limb and a lower limb, the free end of the connector being deformed from the tubular shape of the tubular member such that the two opposing sides of said connector which contain said cross-slot are gradually narrowed to the free terminal end of the connector while remaining spaced one side from the other to give a shape which is effective to strengthen and stiffen said limbs for supporting scaffolding loads and connection stresses, a pair of wedge holes with one hole formed in one limb and the other hole formed in the other limb so that said pair of holes aligns substantially perpendicularly to said slot, said pair of holes further being positioned and shaped so as to align with said bracket's cutout is potentially wedging relationship relative to said wedge when the bracket is positioned in the cross-slot of said connector with the free ends of said limbs abutting said post.

4,493,579

SUPPORT TUBE FOR A TUBULAR ASSEMBLY AND METHOD FOR THE MANUFACTURE THEREOF

Timo Rautakoura, Lapinlahti, Finland, assignor to Varpaja Oy, Varpaisjarvi, Finland

Filed Jan. 13, 1982, Ser. No. 339,179
Claims priority, application Finland, Jan. 22, 1981, 810173
Int. Cl.³ F16B 7/00
U.S. Cl. 403—237 **3 Claims**

1. A support structure for a tubular assembly comprising:

a tube having one end formed into an arcuate recess arranged to receive a cross-tube, the edge of said arcuate recess being drawn into an integral protruding support, and

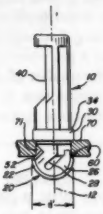
an anchoring bracket secured to one end of said tube, said anchoring bracket being of U shape and extending along the sides of said tube to form a welding bevel therewith.

4,493,580

RETAINING PRONG

William E. Ruehl, Wheeling, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Continuation of Ser. No. 391,787, Jun. 24, 1982, abandoned.
This application Jun. 4, 1984, Ser. No. 616,623
Int. Cl.³ E04G 3/00
U.S. Cl. 403—252 **3 Claims**



1. A plastic fastener comprising:

a base;

a fastener means extending from one side of said base for attaching said fastener to a panel having an aperture, said fastener means having an axis perpendicular to said base, said fastener means including:

a collar having one side secured to said base and symmetrically disposed relative to said axis,

a trunk portion having one end extending from the other side of said collar,

a V-shaped notch on said trunk for engaging one side of said aperture,

first and second surfaces forming said V-shaped notch, said first surface being further from said base than said second surface, said first surface extending at an acute angle relative to said axis,

a resilient curved transition portion formed at the other end of said trunk, and having an outer curved surface,

a tip portion connected to said portion, said tip portion having a second notch for engaging an opposite side of said aperture, said second notch having a latching surface that extends at an acute angle to said axis, said tip portion separated from said trunk by a slot, said slot extending at an acute angle relative to said axis in the same general direction as said first surface extending from the opposite side of said base which provides a lever arm for moving said fastener from said skewed position to a final position

wherein said tip is resilieptly deflected and said notches engage opposite sides of said aperture.

4,493,581

ECCENTRICALLY TIGHTENED LATCH DEVICE

Alva W. Bass, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 1, 1983, Ser. No. 471,078
Int. Cl.³ B25G *3/18*; F16B *21/00*
U.S. Cl. 403—323 5 Claims

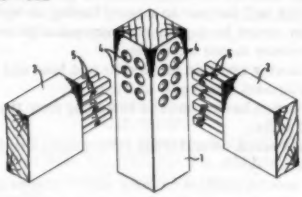
1. An eccentrically tightened latch device comprising a body strap having means at one end for securing to a part to be clamped, and an opening at the other end of said body strap, and eccentric member rotatably mounted in said opening of said body strap and a locking lever integrally secured to said eccentric member for rotating said eccentric member and causing said eccentric member to rotate and change its linear position relative to said body strap, said eccentric member having means thereon for connection to another body part for actuating the body part in the direction of the means on said body strap for securing the body strap to a body part, said locking lever having a stop and handle at the end opposite the end of said locking lever to said eccentric member for limiting motion of said locking lever toward said body strap, and said eccentric member having first and second diameter portions that are concentric and a pin portion that is mounted adjacent the circumference of the smaller of said two diameter portions to provide means for connection to said locking lever and to provide means for connection to the body part.

4,493,582

TENON JOINT FOR WOODEN FRAMES

Karl S. Drabsch, Bergerschleife 3-7, 8481 Pleystein/Opf., Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,454
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303650
Int. Cl.³ F16B *12/44*
U.S. Cl. 403—382 18 Claims



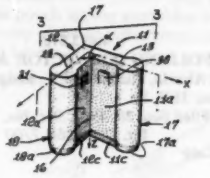
1. Joint construction comprising a first component having a plurality of rows of tenons of rectangular cross-section, each row including a plurality of tenons, and a second component having a plurality of bores of circular cross-section in which respective tenons of the first part are glued, wherein each side length of the cross-section of each tenon is less than the diameter of the associated bore, each diagonal of said tenon cross-section is greater than said diameter, and four gaps of sequentially-shaped cross-section between the edge surfaces of each tenon and the wall of the associated bore are substantially filled with glue.

4,493,583

LOCK-UP CORNER BRACKET FOR FRAME PARTS

Robert S. Wallace, Los Angeles, Calif., assignor to M. Bosley Wright, Owings Mills, Md.

Filed Sep. 26, 1983, Ser. No. 535,784
Int. Cl.³ G09F *1/12*
U.S. Cl. 403—402 9 Claims



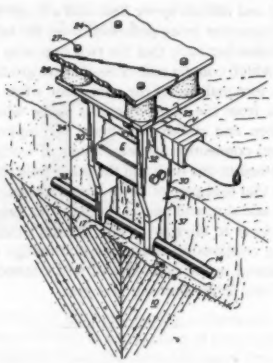
1. A lock-up corner bracket for frame parts, comprising
(a) the bracket having legs that extend in planes which define a corner angle,
(b) the legs having terminal enlargements that are elongated in parallel directions of forward insertion of the legs relatively into recesses formed in said parts, for retaining said parts in assembled relation,
(c) said enlargements being columnar,
(d) the forwardmost end portions of said legs and columnar enlargements being forwardly tapered,
(e) said tapered end portions of the legs and columnar enlargements terminating in a flat plane normal to said parallel directions.

4,493,584

APPARATUS AND PROCESS FOR DOWEL INSERTIONS

Ronald M. Guntert, Stockton, Calif., assignor to Guntert & Zimmerman Const. Div., Inc., Stockton, Calif.

Continuation of Ser. No. 331,864, Dec. 17, 1981, abandoned.
This application Jun. 14, 1984, Ser. No. 620,532
Int. Cl.³ E01C *23/04*
U.S. Cl. 404—74 16 Claims



1. Apparatus for inserting a dowel at an intended joint in a freshly placed concrete slab comprising:
a support member;
first and second dowel arms secured to and vertically depending from said support member, a lower portion of each of said dowel arms having the property of conducting a magnetic field, said dowel arms having lower ends configured to engage the dowel;
means, mounted between said lower portions of said dowel arms at a point spaced apart from said lower ends, for

applying a magnetic field to said lower portions to retain a dowel to said lower ends of said dowel arms;

means for inserting said dowel arms and the dowel retained by said dowel arms therewith into the freshly placed concrete slab; and

means for vibrating said dowel arms and the retained dowel therewith during their insertion into the freshly placed concrete slab, said vibrating means arranged and adapted to fluidize said freshly placed concrete during the insertion.

4,493,585

BITUMINOUS FINISHER

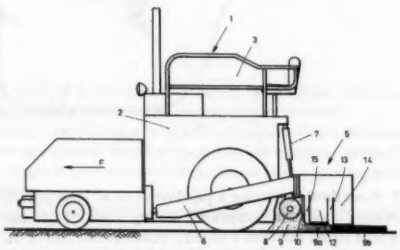
Heinrich Axer, Nettetal, Fed. Rep. of Germany, assignor to Joseph Vogele AG, Munich, Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 366,004

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114049; Mar. 18, 1982, 3209989; Mar. 18, 1982, 3209988

Int. Cl.³ E01C *19/34*

U.S. Cl. 404—102 **16 Claims**



16. A paving machine whereby a surface layer of paving material is compacted, comprising a substantially rigid frame member having downwardly facing means thereon whereby it is supported by a surface therebeneath, a compacting member confined to up and down motion relative to said frame member and having a flat bottom surface which engages material to be compacted to impose compacting force thereon, and force applying means connected between said frame member and said compacting member and reacting between them for intermittent application of force to the compacting member, characterized by:

said force applying means comprising

(1) a reciprocating element movable alternately up and down relative to said frame member and having a substantially rigid force transmitting connection with one of said members,

(2) substantially undamped resiliently yieldable means having a spring constant, said resiliently yieldable means being so connected between the other of said members and the reciprocating element as to react between said members through the reciprocating element and to maintain said compacting member at all times under a downward biasing force that varies in magnitude during up and down movement of the reciprocating element, and

(3) drive means on the frame member for imparting alternate up and down motion to said reciprocating element at a substantially constant frequency which is no lower than the natural frequency fixed by

(a) said spring constant and

(b) the mass of said frame member and components carried thereby that are constrained to vertical motion therewith,

so that the compacting member remains in constant engagement with material to be compacted.

4,493,586

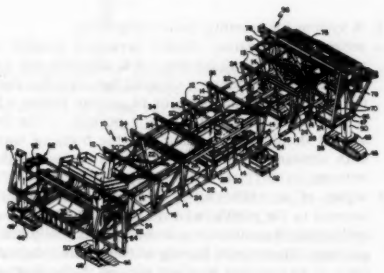
RIP-RAP LAYING MACHINE AND METHOD OF LAYING RIP-RAP

Lee W. Miles, Corinth, Miss.; Samuel W. Chambers, Boise, and Mathias F. Rice, Cascade, both of Id., assignors to Morrison-Knudsen Co., Inc., Boise, Id.

Filed Feb. 16, 1982, Ser. No. 348,781

Int. Cl.³ E02B *3/12*

U.S. Cl. 405—17 **20 Claims**



1. A rip-rap laying machine capable of distributing rip-rap on an acutely angled bank, comprising:

(a) a bridge defining a main structure for the machine;

(b) a plurality of tracks pivotally secured to the bridge through a mast, the tracks allowing movement of the bridge, each track including a mast which is:

(i) extensible to allow raising and lowering of the bridge relative to each track, and

(ii) pivotable relative to the bridge to allow the bridge to assume a plurality of angles relative to each track and to the bank;

(c) means attached to the bridge for pivoting the bridge relative to each mast to vary the angle between the respective track and the bridge;

(d) a dump hopper secured to the bridge to receive rip-rap;

(e) an upper pair of rails secured to the bridge and extending along substantially the entire length of the bridge;

(f) a lower pair of rails secured to the bridge and extending along substantially the entire length of the bridge substantialy parallel with the upper pair of rails;

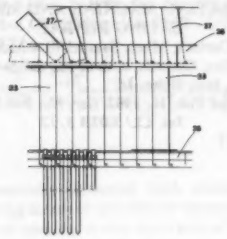
(g) a loading hopper for moving along the bridge along the upper pair of rails, for receiving rip-rap from the dump hopper, and for transporting and discharging the rip-rap to a rip-rap laying means; and

(h) a rip-rap laying means for moving along the bridge along the lower pair of rails, for receiving rip-rap from the loading hopper at any point along the length of the bridge, and for distributing the rip-rap along the bank.

4,493,587
SYSTEM FOR CREATING DAMS WITH MOBILE AND/OR PARTIALLY MOBILE WATER-RETAINING ELEMENTS

Antonio Ferrari, Via Celestino Lendri, Fumane (Verona), Italy

Filed Oct. 8, 1981, Ser. No. 309,744
Claims priority, application Italy, Feb. 18, 1981, 84961 A/81; Apr. 8, 1981, 84923 A/81
Int. Cl.³ E02B 7/40
U.S. Cl. 405—114 9 Claims



1. A system for creating dams comprising:

a series of foundation plinths arranged parallel to one another, each plinth having a first shoulder and a second shoulder which define a channel between the shoulders, the plinths being adapted for placement below a bottom of a body of water with only a portion of the first and second shoulders extending into the body of water and with substantially the entire channel disposed below the bottom;

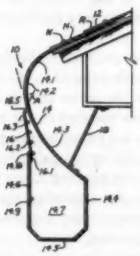
a series of movable water-retaining elements pivotally secured to the plinths so as to pivot from a first substantially upright position to a second substantially horizontal position, the elements having a cross section shaped in the form of an inverted V when viewed in the first position along the channel in a direction perpendicular to a length of the plinths, the elements being arranged so that in the first position a substantially water tight seal is formed between the elements and so that in the second position the elements are disposed substantially within the channel with the elements being nested within an adjacent element, and;

means for moving the movable elements from the first position to the second position.

4,493,588
NON-CLOGGING EAVES TROUGH

Gifford R. Duffy, 2051 - 211th Ave., N.E., Redmond, Wash. 98052

Filed Sep. 21, 1981, Ser. No. 303,829
Int. Cl.³ E02B 9/04; E04D 13/00
U.S. Cl. 405—119 9 Claims

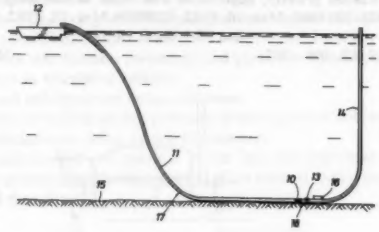


1. A non-clogging eaves trough comprising an elongated sheet formed with a flange attachable to a building, a continuous smoothly curved portion extending from the flange outwardly and downwardly and then downwardly and inwardly with respect to the vertical, a generally upwardly open trough section carried by and below the curved portion, the curved portion having an outermost reach extending outwardly of and overhanging the outermost extent of the trough section, and a generally vertical screen extending between the trough section and the smoothly curved portion and making a sharp angle with the latter portion, the screen engaging the smoothly curved portion below the outermost reach of the latter.

4,493,589
INTERNAL PIPELINE PLUG FOR DEEP SUBSEA OPERATIONS

John M. Ward, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 278,937, Jun. 30, 1981, Pat. No. 4,390,043.
This application Feb. 2, 1983, Ser. No. 463,212
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.³ F16L 1/04
U.S. Cl. 405—166 2 Claims

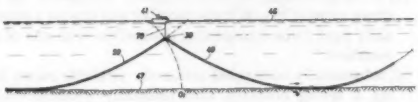


1. A method for laying a pipeline in an at least near neutral buoyancy condition comprising sealing a gas into at least part of a pipe string between a pipelay vessel at one end of the pipe string and a pressure releasable plug within the pipe string, connecting the pipe string to another pipe end, flooding the pipe string and releasing the plug with fluid pressure, and passing the plug out of the pipe string with the fluid pressure.

4,493,590
METHOD AND APPARATUS FOR ON SURFACE JOINING OF SUBMARINE PIPELINE SEGMENTS USING AN ECCENTRIC HINGE

Ray R. Ayers, and Dean P. Hemphill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 106,820, Dec. 26, 1979, abandoned.
This application Jan. 15, 1982, Ser. No. 339,607
Int. Cl.³ F16L 1/04
U.S. Cl. 405—170 11 Claims

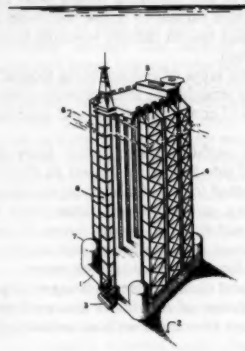


1. A method for the offshore joining of two pipe strings at least near the surface of the water, part of each pipe string laying on the seafloor during at least part of the time of joining, comprising suspending the two pipe strings from means above the seafloor and holding each pipe string in a "J" configuration while adjacently positioning the upper ends of the pipe strings with the lower ends of the pipe strings spaced apart, hinging the adjacent pipe ends together, and lowering the hinged pipe ends to the seafloor while simultaneously exerting axial tension on one of the pipe strings from a remote location.

4,493,591
FLOATABLE OFFSHORE PRODUCTION STRUCTURE AND METHOD FOR FABRICATION, TRANSPORT AND INSTALLATION OF SAME

Alex W. Francis, Jr., Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 16, 1983, Ser. No. 466,803
Int. Cl.³ B63B *35/44*
U.S. Cl. 405—198 4 Claims



1. An offshore production installation for a subsea location, including,

a steel-reinforced concrete gravity structure which includes a caisson section for oil storage and has a regular geometric shape in plan and provides a horizontal upper support surface,

a framework permanently mounted on the upper horizontal surface of the gravity structure and vertically extending at least four support legs a predetermined distance above the gravity structure and providing access to a position within the framework and on top of the gravity structure,

a plurality of buoyancy chambers connected to the upper horizontal surface of the gravity structure at spaced locations where they will function to provide stability during flotation of the gravity structure,

a buoyant production deck nestable in the position provided within the support legs of the framework and on the upper horizontal surface of the gravity structure,

and jacking mechanism connecting the production deck to the support legs with which the production deck is moved between the upper horizontal surface of the gravity structure and a predetermined elevation above the gravity structure.

4,493,592
GROUTING METHOD

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

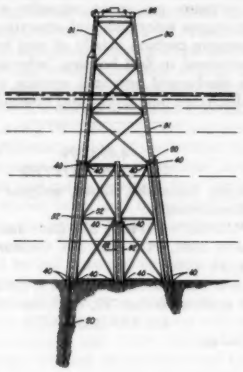
Filed Sep. 28, 1982, Ser. No. 425,346
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—225 16 Claims

1. A method of grouting the annular space formed between either a jacket leg or pile sleeve and a pile driven therethrough of an offshore platform, or other similar annular space, said method comprising the steps of:

injecting an alkali silicate material which flocculates upon contact with sea water into said annular space;

confining substantially within said annular space the alkali silicate material which has flocculated upon contact with the sea water thereby forming an annular plug of flocculated alkali silicate material substantially within said annular space;

injecting cement or grout into said annular space; and

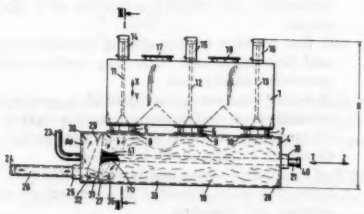


supporting the cement or grout injected into said annular space by the alkali silicate material which has flocculated until the cement or grout has set.

4,493,593
METHOD AND DEVICE FOR CONTINUOUS TRANSPORTING POWDERED, FINE-GRAINED AND COARSE-GRAINED MATERIALS

Heinrich Schlimbach, Essen, Fed. Rep. of Germany, assignor to Ferroplast Gesellschaft fiir Metall- und Kunststoffepzeucnisse mbH, Hattingen, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,353
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138657
Int. Cl.³ B65G *53/16*
U.S. Cl. 406—146 21 Claims



1. A device for continuous transporting materials in powder, fine-grained or coarse-grained state, particularly dam materials in underground mines, comprising at least one storage container containing a material to be transported, a conveyor located below said storage container and receiving the material discharged from said container, said conveyor including at least one tubular housing into which the material is discharged and having an axis; said housing having an inner peripheral wall; a gas pressure supply means connected to said housing and forming therein a pressure gas space; a separating member axially movable in said housing and having one side facing said pressure gas space and an opposite side facing a conveyor space containing said material; and a conveyor discharge pipe connected to said conveyor space, said separating member having a periphery and being formed with at least one opening connected to said conveyor discharge pipe, said separating member being peripherally spaced from said inner peripheral wall of said housing to form therebetween a through passage

continually connecting said pressure gas space with said conveyor space so that a pressure gas cushion of a variable size is formed in said conveyor space in the region of said opposite side; said pressure gas cushion being supplied with pressure gas from said pressure gas space whereby a material-pressure gas-mixture stream is formed; said separating member moving said gas pressure cushion axially of said housing against the material contained in said housing, whereby said mixture is continually discharged into said opening and then into said conveyor discharge pipe unless said housing is empty.

4,493,594

MILLING CUTTER

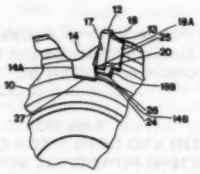
Minoru Okada, Yokosuka, Japan, assignor to Santrade Ltd., Luzern, Switzerland

PCT No. PCT/SE79/00140, § 371 Date Jan. 9, 1981, § 102(e) Date Jan. 9, 1981, PCT Pub. No. WO80/02812, PCT Pub. Date Dec. 24, 1980

Continuation of Ser. No. 229,563, Oct. 9, 1981, abandoned. This PCT application Jun. 19, 1979, Ser. No. 543,801

Int. Cl.³ B23C *5/22*

U.S. Cl. 407—41 **4 Claims**



1. In a rotary milling cutter of the type comprising a rotary cutter body having a plurality of circumferentially spaced apart recesses, and a plurality of cutter means mounted in said recesses, the improvement wherein:

each of said recesses includes a first and second supporting surfaces, and first and second reaction surfaces,

said first supporting surface extending generally radially inwardly from an outer periphery of said body,

said second supporting surface facing generally radially outwardly and defining a portion of a floor of said recess,

said first reaction surface spaced circumferentially from said first and second supporting surfaces and oriented generally radially, and

said second reaction surface extending generally radially inwardly from said second supporting surface and being situated opposite said first reaction surface to form therewith a clamp-receiving groove,

each of said cutter means comprises:

a supporting plate mounted in a respective one of said recesses and including

a first seating surface which engages said first supporting surface,

a stepped portion having a second seating surface which engages said second supporting surface, and

a side wall extending generally radially outwardly from said stepped portion to define therewith an insert-receiving pocket within said recess,

a cutter insert having first and second generally parallel side faces and an edge surface interconnecting said first and second side faces, the intersection of said edge surface and said first side face defining an edge portion of said insert,

said second side face engaging said side wall of said pocket,

said edge surface resting upon said stepped portion of said supporting body in engagement therewith,

clamping means disposed in said clamp-receiving groove for holding said insert in position relative to said cutter body, said clamping means including a first side face, and a second side face disposed opposite said first side face and engaging said first reaction surface,

securing means for securing said clamping means to said cutter body and arranged to move said clamping means in a generally radially inward direction toward a clamping position such that

said first side face of said clamping means bears against said first side face of said insert to define therewith a first area of contact,

said first side face of said clamping means bears against said second reaction surface to define therewith a second area of contact spaced radially inwardly from said first area of contact,

said first and second areas of contact being located such that an imaginary straight line interconnecting said first and second areas of contact intersects said edge surface of said insert;

said first supporting surface of said cutter body facing toward said second side face of seid insert to absorb circumferentially directed forces of said clamping means,

said second supporting surface of said cutter body being disposed between said first and second areas of contact and facing toward said edge surface of said insert to absorb radial inward forces from said cutter means,

said first side face of said clamping means being arranged to bridge said edge portion of said insert intermediate said first and second areas of contact without contacting said edge portion, and

the distance between the radially innermost point of said first area of contact and said second supporting surface of said body being longer than the distance between said second supporting surface of said body and the radially innermost point of said second area of contact.

4,493,595

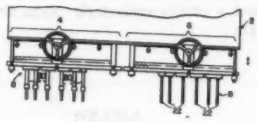
COMPACT MULTIPLE SPINDLE BORING HEAD WITH QUICK CHANGE TOOL SUPPORTS

Harold A. Klein, Shawnee, Kans., assignor to Colt Industries Operating Corp, New York, N.Y.

Continuation of Ser. No. 945,489, Sep. 25, 1978, abandoned. This application Nov. 21, 1980, Ser. No. 209,031

Int. Cl.³ B23B *39/20*

U.S. Cl. 408—46 **15 Claims**



1. Apparatus for simultaneously positioning a plurality of rotatable spindles comprising:

(a) a machine frame including a support plate having an upper and a lower surface arranged generally perpendicular to a machine axis, said support plate containing a plurality of lineal slots extending therethrough and arranged radially with respect to the machine axis and equally spaced angularly about said axis;

(b) a group of spindle assemblies, each said spindle assembly including a boring spindle journaled for rotation about a spindle axis;

(c) spindle mounting means for mounting each said boring

spindle on said machine for radial movement relative to a machine axis in a manner to maintain said spindle axes parallel to all other spindle axes and to said machine axis, said spindle mounting means including, for each said spindle assembly, bearing means comprising an upper bearing plate having a flat bearing surface in sliding contact with the upper surface of said support plate, a spindle housing formed on said upper bearing plate, said boring spindle being mounted within said spindle housing, and a lower bearing plate having a flat bearing surface in sliding contact with the lower surface of said support plate, said flat bearing surfaces extending across and on either side of each said slot in said support plate, means extending through said support plate to connect said upper and lower bearing plates and a slot guide connected to said bearing means and positioned within the slot across which said bearing surfaces extend; and

(d) spindle translating means interconnected between said machine frame and said spindle mounting means for simultaneously moving each said boring spindle relative to said machine axis along a lineal path between a first position in which each said boring spindle is spaced at a predetermined minimum radial distance from said machine axis and a second position in which each said boring spindle is spaced at a predetermined maximum radial distance from said machine axis while said spindle translating means maintains a fixed radial extent at all times relative to said machine axis as said boring spindles move between said first and second positions, said translating means insulating a rotatably mounted master ring gear surrounding said spindle assemblies, and a plurality of lead screw means extending between said master ring gear and said spindle assemblies, respectively, each said lead screw means being mounted to rotate about its longitudinal axis upon rotation of said master ring gear while maintaining a fixed position along its longitudinal axis relative to said machine axis, each said spindle assembly including threaded means mounted on said spindle housing for engaging an associated lead screw means to cause the associated boring spindle to move toward said first position when said lead screw means rotates in one direction and to move toward said second position when said lead screw means rotates in an opposite direction, said master ring gear being positioned above the upper surface of said support plate by a distance which exceeds the thickness of said upper bearing plates, and said elongated slots extending sufficiently to permit said upper bearing plates to move between said master ring gear and said support plate when said boring spindles are moved to said second position.

4,493,596

ROTARY MATERIAL REMOVING TOOL

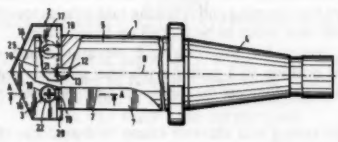
Manfred Grunsky, Dreieichenhain; Reiner Sussmuth, Neu Isenburg; Dieter Dehn, Frankfurt am Main, and Günter Ischen, Oberhausen, all of Fed. Rep. of Germany, assignors to Stellram S.A., Nyon, Switzerland

Filed Dec. 17, 1982, Ser. No. 450,678

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204210

Int. Cl.³ B23B *51/00*

U.S. Cl. 408—233 **17 Claims**



1. A material removing tool, such as a milling cutter, comprising a rotary holder having a front portion provided with a transverse slot and including a pair of prongs having internal surfaces flanking said slot, said slot being disposed at least substantially centrally of said holder, said front portion having a bottom surface in said slot and said bottom surface including two mutually inclined sections having portions disposed at the opposite sides of the axis of said holder, each of said sections being adjacent to a different one of said internal surfaces and such sections making acute angles with the respective internal surfaces, at least one said prongs having a first bore communicating with said slot and having a first axis; a cutter disposed in said slot and having a rear surface adjacent said bottom surface and a second bore with a second axis parallel to said first axis, said rear surface having two mutually inclined sections each abutting against a different section of said bottom surface, said first axis being disposed between said second axis and said bottom surface and said cutter having a first annular surface surrounding said second bore; and means for coupling said cutter to said holder, including a shank extending into said first bore and a head having a larger diameter than said shank and extending into said second bore and having a second annular surface, at least a portion of at least one of said annular surfaces being at least substantially conical and bearing against the other of said annular surfaces to thereby urge said rear surface against said bottom surface, said cutter further having a passage communicating with said second bore and extending to said rear surface to allow for extraction of said cutter from said slot while said coupling means extends into said slot.

4,493,597

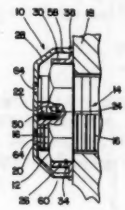
NUT LOCK ASSEMBLY

Jeffrey O. Rolf, Mentor, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 7, 1982, Ser. No. 415,066

Int. Cl.³ F16B *39/36*

U.S. Cl. 411—198 **3 Claims**



1. A nut lock system for positively removably retaining a nut having a plurality of flat surfaces on the outer periphery thereof on the externally threaded end of a shaft, said system comprising;

an internally threaded bore formed in the end of said externally threaded shaft, the internal threads of said internally threaded bore of the opposite hand as the external threads of said externally threaded end of said shaft;

a locking cup member including a hub portion having a centrally located axially extending aperture therethrough and a transversely extending flange portion, said aperture configured to closely conform to the outer periphery of said nut whereby said locking cup member may be slipped onto said nut for rotationally fixing said locking cup member to said nut, the outer periphery of said flange portion provided with a plurality of radially outwardly extending ramp type ratchet teeth, each of said teeth defining a generally radially outwardly extending shoulder surface and a radially outwardly inclined ramp surface, said inclined ramp surfaces extending radially outwardly in the opposite circumferential direction as the direction of rotation of said nut being tightened onto said shaft, and

a locking cap member comprising a resiliently deformable portion and an externally threaded stud portion fixed

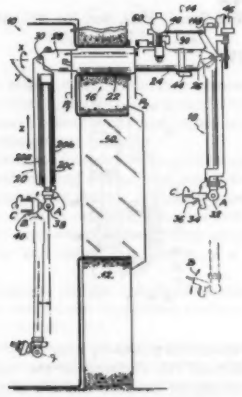
thereto, said externally threaded stud portion threadably receivable in said internally threaded bore formed in the end of said externally threaded shaft, said resiliently deformable portion comprising a generally flat transversely extending base section and outwardly extending finger section, the free ends of said finger section extending generally parallel to said stud portion and in the same direction, the free end of said finger section, in the nondeformed position thereof, separated from the rotational axis of said stud by a distance equal to or less than the radius defined by the most radially inwardly points of said shoulder surfaces of said ratchet teeth, said base section provided with a fitting for receipt of a tool engageable with the side of said base section opposite the side from which said externally threaded stud extends, said free end of said finger sections ratchetly engaged with the ratchet teeth on said locking cup member when said base section abuts the end of said shaft.

4,493,598

MASTER-SLAVE TYPE TELESCOPIC TELEMANIPULATOR

Charles Glachet; Daniel Francois, both of Vendome; Jean Tenté lier, Moree, and Christian Frioux, Vendome, all of France, assignors to La Calbene, Benzous and Commissariat a l'Energie Atomique, Paris, both of, France

Filed Jan. 18, 1983, Ser. No. 458,886
Claims priority, application France, Jan. 19, 1982, 82 00734
Int. Cl.³ B25J *3/00*
U.S. Cl. 414—1 **8 Claims**



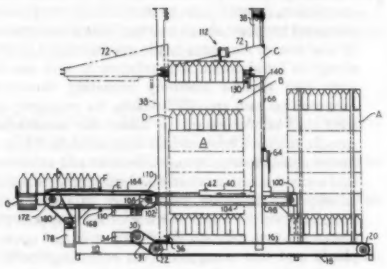
1. A telescopic telemanipulator comprising: A traversing block which traverses a compartment and which is mounted to rotate around its own axis; a telescopic master arm and a telescopic slave arm, such arms being articulated to the traversing block around two shoulder pivots orthogonal to the axis of the block; a control handle mounted at the free end of the master arm; a gripper member mounted at the free end of the slave arm; means for transmitting to the slave arm and the gripper member movements imparted to the master arm and the control handle; means for offsetting the slave arm in relation to the master arm, enabling the length and orientation of the slave arm around its shoulder pivot to be modified without modifying the corresponding coordinates of the master arm; and means for equilibrating the master arm and means for equilibrating the slave arm, wherein the means for equilibrating the slave arm comprise at least a first counterweight mounted on a first link articulated to the traversing block on the master arm side and in the opposite direction in relation to said master arm around a pivot parallel with the shoulder pivot of the master arm, means for displacing the first counterweight along the first link, said means for offsetting the length of the slave arm in relation to the length of the master arm simultaneously actuating said means for displacing the first counterweight and at least a second counterweight mounted on a second link articuluated to the traversing block on the master arm side and in the opposite direction in relation to said master arm around a pivot parallel with the shoulder pivot of the master arm, means for displacing the second counterweight along said second link, said means for transmitting to the slave arm any modification in the length of the master arm simultaneously actuating said means for displacing the second counterweight.

4,493,599

ARTICLE DEPALLETIZER

Thomas S. Hartness, Rte. 12, Paris Mtn., Greenville, S.C. 29609, and Thomas P. Hartness, Rte. 2, Smith Dr., Greenville, S.C. 29607

Filed Dec. 2, 1982, Ser. No. 446,234
Int. Cl.³ B65G *59/02*
U.S. Cl. 414—120 **13 Claims**



6. A device for depalletizing tiers of articles located on a pallet, one tier at a time, and depositing said articles on a receiving table comprising:

an elevator clamp means for moving a tier of articles which extends over said pallet including,

(i) four interdependent spaced side walls carried in a substantially rectangular configuration, each side wall having a first and a second end, and a clamping surface generally between said first and second ends for engaging said articles arranged in a rick-rack order;

(ii) means for selectively moving said walls betweeen a closed position and an opened position so that said first ends of said side walls move inwardly past the second ends of said side walls to provide a progressively reducing rectangular clamping area and a uniform clamping force for clamping and retaining said articles together in a rick-rack order to be picked up in said tier;

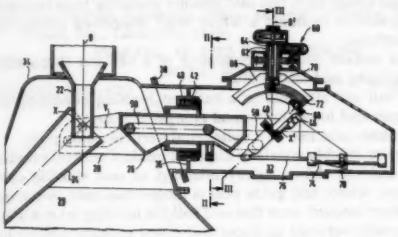
elevator means for lowering said elevator clamp in an opened position to a position wherein said side walls of said clamp encompass the top tier of articles on said pallet; and

means for raising said elevator clamp with said tier of articles and moving said elevator clamp with said articles over a receiving table and depositing said articles on said receiving table

4,493,600
FURNACE CHARGING SYSTEM

Edouard Legille, Luxembourg, and Pierre Mailliet, Howald, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Apr. 14, 1982, Ser. No. 368,365
Claims priority, application Luxembourg, May 18, 1981, 83370
Int. Cl.³ F27B 1/20
U.S. Cl. 414—208 **19 Claims**



1. Apparatus for controlling the movements of an elongated member positioned within an enclosure, the movable member having a first longitudinal axis and being pivotally supported ajacent its first end, the pivotal support permitting rotation of the member about a second axis transverse to the first longitudinal axis, the pivotal support defining a third axis which intersects the first and second axes, the pivotal support being rotatable about the third axis, said control apparatus comprising:

control means, said control means being located to the exterior of the enclosure, said control means including a control device defining a fourth axis, said control means further including means supporting said control device being supported for oscillatory movement about fifth and sixth axes which intersect said fourth axis whereby said control device has the same degree of freedom of movement as the elongated member which is to be controlled;

means for imparting movement to said control device to cause said control device fourth axis to undergo the angular movements with respect to said fifth and sixth axes it is desired to impart to the elongated member first axis respectively with respect to said second and third axes;

first actuator means for causing the elongated member to pivot about the second axis;

second actuator means for causing the pivotal support of the elongated member to pivot about the third axis;

means for sensing differences between the angular orientation of said control device fourth axis with respect to said fifth and sixth axes and respective of the angular orientation of the elongated member first axis with respect to the second and third axes and for generating signals commensurate with said differences in between control device and elongated member angular orientation; and

means responsive to said signals commensurate with differences in angular orientation for energizing respective of said first and second actuator means to null the angular orientation differences.

4,493,601
HIGH CAPACITY, SELF-UNLOADING FORAGE HOPPER

Amos G. Hill, Hesston, and Arlen J. Wiens, North Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

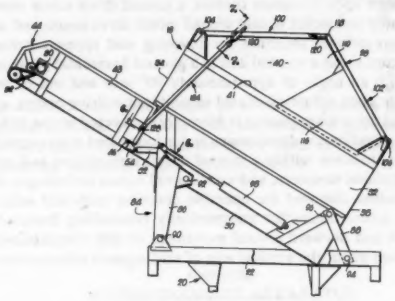
Filed Mar. 5, 1982, Ser. No. 354,938
Int. Cl.³ B60P 1/04; A01D 90/00
U.S. Cl. 414—491 **6 Claims**

1. A vehicle for use in transporting harvested crops comprising:

a mobile frame;

a crop receiving container carried by said frame and shiftable between an over-the-road travel condition in which the container is compacted to its minimum height and width dimensions and a field working condition for loading, collecting, and unloading harvested crops in which the container exceeds said minimum height and width dimensions,

said container including a top wall portion thereof which is shiftable into a high capacity position to expand the volume of said container when the latter is in said field working condition; and



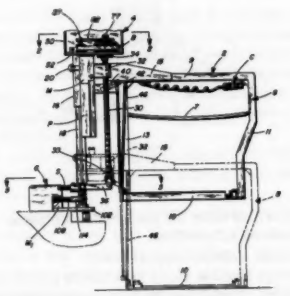
means for unloading crops from the container while the latter is in said field-working condition,

said unloading means including a discharge spout shiftable relative to said top wall portion between a standby position and an operating position, said top wall portion being provided with means coupling the top wall portion with said spout and responsive to shifting of said spout into and out of its operating position for effecting said shifting of the top wall portion into and out of its high volume position.

4,493,602
WHEELCHAIR LIFT APPARATUS

Charles F. Koerber, 8905 Mentor Ave., Mentor, Ohio 44060

Filed Jul. 30, 1981, Ser. No. 288,379
Int. Cl.³ B66B 9/20
U.S. Cl. 414—541 **10 Claims**



1. The wheelchair lift apparatus of the type for wheeling a disabled person into and out of a vehicle such as a van of the like comprising a column support structure adapted to be fixedly mounted within said vehicle, a wheelchair lift structure mounted for vertical up and down movement on said column support structure and for pivotal movement on said column support structure in a generally horizontal plane about a vertical axis, first drive screw means mounted on said column support structure for raising and lowering said wheelchair lift

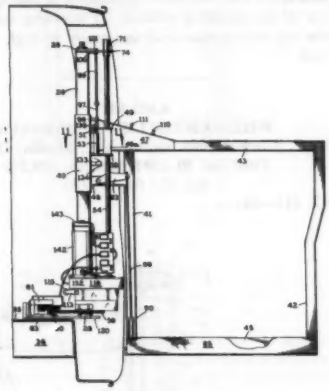
structure in a vertical direction, first motor means mounted on said support structure for operably driving said first drive screw means for raising and lowering said wheelchair lift structure in said vertical direction; second motor drive means mounted adjacent the bottom of said support structure for pivoting said wheelchair lift structure about the vertical axis of said support column structure in a generally horizontal plane, one-way brake means operably associated with said first motor means and with said first drive screw means for providing an automatic braking action on said drive screw means to prevent vertical downward dropping movement of said wheelchair lift structure upon actuation thereof, a second drive screw means operably connected to said second motor drive means and said support column structure for pivoting said support column structure about a vertical axis in a general horizontal plane and through an angle of approximately 90° into and out of said vehicle upon actuation of said second motor drive means, said second drive screw means is drivingly connected at one end to said second motor drive means and is journalled at its opposite end for rotation within a journal means disposed on said support column structure, and said journal means including a slip mechanism disposed for operable coaction with said second drive screw means for automatically controlling horizontal inward and outward pivotal movement of said wheelchair lift structure about the vertical axis of said support column structure.

4,493,603

WHEEL CHAIR LIFT APPARATUS

Claude E. Williams, and F. Alan Gates, both of 832 NW. 1st St., Fort Lauderdale, Fla. 33311

Filed Feb. 8, 1982, Ser. No. 346,552
Int. Cl.³ B60P *1/44*
U.S. Cl. 414—541 **9 Claims**



1. In a wheel chair lift platform comprising:
a horizontal lift platform;
a rotatable vertical support post;
a carriage slidable along said support post and operatively coupled to said support post to turn in usison with it;
means rigidly connecting said lift platform to said carriage for movement in unison with it;
a rotatable, vertical power driven lead screw for raising and lowering said carriage along said support post;
retractable retainer means operatively pivotally associated along the rear edge of said lift platform for movement between a retracted position in which it permits the wheel chair to move onto or off the platform and a raised position in which it retains the wheel chair on the lift platform;
motors for raising and lowering the aforesaid carriage along said rotatable post and for turning said post between its inner and outer positions; and
control means for connecting said disconnecting electrical power to said motors;
the improvement which comprises:
on-center retainer actuating train means operatively connected with said carriage such that said retainer actuating train means is operated from a retracted to a raised position when said carriage is supporting the weight of said lift platform;
reinforcing means associated with said retainer actuating train means such that said retainer actuating train means is capable of retaining a wheel chair positioned on the lift platform;
a lost motion coupling consisting of a ball nut threadedly engaging said lead screw;
said ball nut attached to a ball nut housing consisting of upper and lower horizontal elongated plates;
said plates attached to a cylindrical vertical guide post;
said post slidably coaxially disposed inside a vertical tubular cylindrical sleeve rigidly attached to said slidable carriage, where said guide post is longer than said sleeve by a short amount, such that said ball nut housing is vertically movable between an upper and lower position relative to said carriage by a distance equal to said short amount;
a first actuating generally vertical rod with its upper end in a loosely jointed connection attached to aforesaid ball nut housing and with its lower end pivotally attached to a lever at a point on said lever that is generally midway between the two ends of the lever;
said lever extending generally horizontally and radially from the axis of the aforesaid pivotable vertical post attached pivotally in a vertical plane to said carriage at the end of the lever nearest to said axis, and such that the end of the lever farthest away from said axis desribes a vertical arch between an upper and lower position in unison with the upper and lower positions of the aforesaid ball nut housing;
a second actuating rod attached to the end of said lever farthest away from said axis in a loosely jointed connection and sloping generally downward to a point of rigid attachment to a stirrup positioned as an inverted U with its two prongs pointing downward in extension of said second actuating rod with the lower ends of said prongs pivotally attached to the apex closest to the rear edge of said platform of two actuators shaped as two obtuse triangles disposed in two parallel vertical planes where said actuators are attached pivotally in a vertical plane about a pivot pin disposed horizontally and parallel with the rear edge of said platform; and
through that apex of said triangular actuators that is nearest to the upper surface of said platform; and
through a hole in a vertical first projection, said first projection disposed in a vertical plane parallel with and between the vertical planes defining said actuators;
said projection, rigidly attached to the upper surface of said platform and such that the third apex of said triangular actuators can describe an arch of generally 90 degrees in the vertical plane as said actuators are pivoted from a generally horizontal position oriented toward the front edge of said platform to a generally vertical position, as said second actuation rod is operated between its upper and lower position by aforesaid lever;
an actuating bar, at one end generally horizontally oriented, disposed in a vertical plane perpendicular to the rear edge of said platform between said actuators attached at one end pivotally to the third apex of said triangular actuators and at the other end attached pivotally to a second projection attached to the upper surface of aforesaid retaining lip attached pivotably to the rear edge of said platform such that as the aforesaid two triangular actuators are pivoted between their horizontal and vertical positions,
said actuating bar will operate said retaining lip to pivot between its raised position and its retracted position in

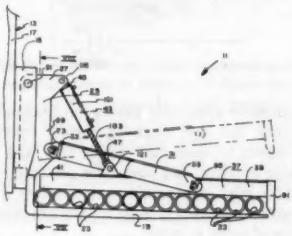
which it is generally co-planar with said platform and such that in its raised position the three points namely the point of attachment between said second projection and said actuating bar, the point of attachment between said triangular actuators and said first projection and the point of attachment between said actuating bar and said triangular actuators are disposed on a straight line thereby placing said two last-mentioned points on center with the first-mentioned point of attachment.

4,493,604

FORK LIFT CLAMP APPARATUS

Evo M. Walker, Louisville, Miss., assignor to Taylor Machine Works, Inc., Louisville, Miss.

Filed Oct. 14, 1982, Ser. No. 434,348
Int. Cl.³ B66F 9/18
U.S. Cl. 414—622 **5 Claims**



1. A clamp apparatus for use with a forklift truck of the type including a carriage, an L-shaped fork member, and a pivot rod for pivotally attaching said fork members to said carriage, said clamp apparatus comprising:

(a) a frame member for straddling said fork member and for being pivotally attached to said pivot rod, said frame member having an upper end and a lower end;

(b) a flapper arm having a first end and a second end, said first end being pivotally attached to said frame member substantially adjacent said lower end of said frame member;

(c) a clamp arm having a first end and a second end, a portion of said clamp arm located between said ends of said clamp arm being pivotally attached to said flapper arm substantially adjacent said second end of said flapper arm; and

(d) piston means having a first end and a second end, said first end of said piston means being attached to said frame member substantially adjacent said upper end of said frame member, said second end of said piston means being attached to said clamp arm substantially intermediate said first and second ends of said clamp arm, movement of said first and second ends of said piston means toward and away from one another causing said clamping arm to move between an opened position for allowing pipes and the like to be loaded onto and off-of said fork member and a closed position for clamping pipes and the like onto said fork member.

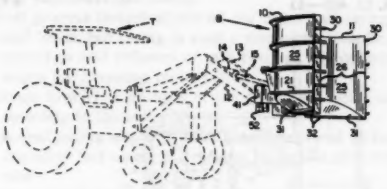
4,493,605

MATERIAL HANDLING APPARATUS FOR LOADERS

Steven R. Cullen, 1167 Harrison, Astoria, Oreg. 97103

Filed Jun. 14, 1982, Ser. No. 388,273
Int. Cl.³ B65G 47/90
U.S. Cl. 414—726 **9 Claims**

1. A clamshell-type loader bucket adapted for mounting on a lifting boom on a tractor comprising a pair of bucket jaws pivotally mounted on vertical axes on one side of the bucket for opening and closing movements when the bucket is in vertical position, said bucket having an open top and a hopper bottom formed by inclined bevel plates on said jaws extending across the entire area of the bottom of the bucket arranged to force material upward in the bucket as the jaws close on said material, said bevel plates having scraper edges to scrape up said material from a flat supporting surface when the bucket is



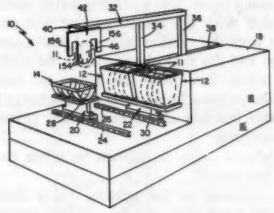
advanced across said surface in a vertical position by said tractor with said jaws wide open, said scraper edges extending in a horizontal plane across the entire width of said open jaws when the bucket is in said vertical position.

4,493,606

WAFER TRANSFER APPARATUS

Richard F. Foulke, Carlisle, and Steven M. Lord, Malden, both of Mass., assignors to Proconics International, Inc., Woburn, Mass.

Filed May 24, 1982, Ser. No. 381,292
Int. Cl.³ B65G 17/32
U.S. Cl. 414—787 **32 Claims**



1. Apparatus for placing a first element in a precise receptacle location on a second element, there being associated with said precise receptacle location some known variation in the shape of said second element, said apparatus comprising

a support member for supporting said first element while said member is translated toward said second element along a placement direction,

first transport means for moving said support member or said second element along a direction transverse to said placement direction, and

sensing means located on said support member for sensing the relative alignment along said transverse direction of said support member and said variation in shape,

said sensing means comprising

an energy-beam source adapted and positioned to direct an energy beam along a path that interacts with said variation in shape at least when said support member and receptacle location are aligned so that more of said beam is transmitted along said path when said member and receptacle location are aligned than when said member and receptacle are not aligned and

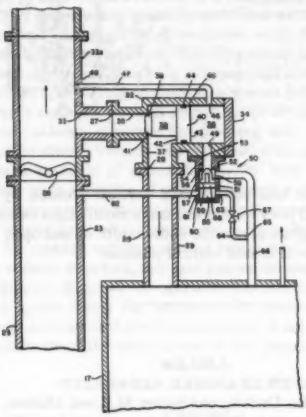
an energy beam sensor adapted and positioned to detect the difference in the amount of said beam transmitted along said path.

4,493,607

TEE-TYPE VALVE FOR SELF-PRIMING PUMP SYSTEM

Pellegrino E. Napolitano, Middletown, N.J., assignor to Hudson Engineering Company, Bayonne, N.J.

Filed Dec. 16, 1982, Ser. No. 450,442
Int. Cl.³ F04D 27/00
U.S. Cl. 415—11 4 Claims



1. In a self-priming pump system including a liquid pump, a suction tank in communication with the pump, a discharge line connected to the pump and including a first check valve positioned downstream of the pump a distance sufficient to provide a column of priming liquid, and a priming valve having an inlet in communication with the discharge line and an outlet in communication with the suction tank and positioned between the pump outlet and the first check valve, the priming valve responsive to liquid flow from the pump to automatically permit flow of the priming liquid from the discharge line to the suction tank when suction at the pump inlet is lost, the improvement comprising:

a. a second check valve positioned between the priming valve and the pump;

b. a piston connected to the priming valve slidably positioned within a cylinder, one face of said piston exposed directly to the discharge line static pressure, and the other face of said piston exposed via the priming valve to the discharge line static pressure;

c. a conduit connecting the one face of the piston to the suction tank;

d. a pilot valve blocking said conduit;

e. a bleed line communicating the rear of said pilot valve and the suction tank;

f. bleed valve means positioned in said bleed line to control the flow of fluid therethrough; and

g. a second conduit connecting the discharge line upstream of the second check valve to the rear of the pilot valve.

4,493,608

SURGE CONTROL IN COMPRESSOR

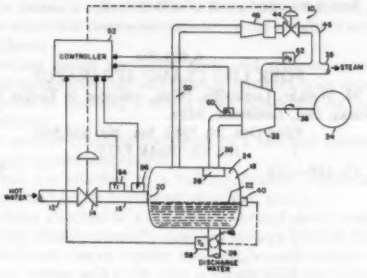
Duane B. Paul, Leominster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 27, 1982, Ser. No. 453,535
Int. Cl.³ F04D 27/02
U.S. Cl. 415—11 8 Claims

1. In an apparatus for producing a high temperature, high pressure vapor from a lower vapor and liquid source including a flash tank having a hot liquid inlet, a vapor outlet and a liquid outlet; a compressor inlet connected to the vapor outlet of the flash tank; a control system for preventing the occurence of vapor surge within the compressor comprising:

an inlet liquid control valve positioned upstream from the flash tank hot liquid inlet;

a recycle control valve positioned in a conduit connecting the compressor discharge with the compressor inlet whereby vapor may be recirculated through the compressor to avoid surge; and,



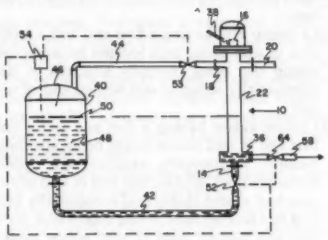
a programmable controller having programmed therein a surge limit line and receiving further operating inputs with respect to flash tank vapor flow and compressor discharge pressure; said controller providing control signals to the inlet and recycle control valves whereby said inlet valve is opened a preselected amount prior to causing the recycle valve to open.

4,493,609

PUMPING APPARATUS

George J. Morgan, Ossining, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 28, 1983, Ser. No. 470,364
Int. Cl.³ F04D 15/02
U.S. Cl. 415—20 5 Claims



1. An apparatus for pumping a liquid stored under pressure without pressure-induced, liquid leakage during seal failure comprising in combination:

(a) a vessel capable of containing a liquid under pressure;

(b) a vertical pump having an inlet port in communication with the vessel;

(c) a shaft housing of the pump and a conduit connected to the shaft housing, said conduit being connected to the vessel at the other end with both ends of the conduit being located above the level of the liquid to be contained within the vessel; and

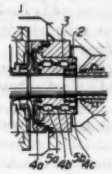
(d) a shaft seal on the shaft conveying rotary power to the impeller of the pump located within the pump above the point where the conduit is connected to the shaft housing and above the liquid level so that the vessel and the shaft housing is pressure-equalized during seal failure.

4,493,610

AXIAL THRUST BALANCING SYSTEM

Toshiki Iino, Ibaraki; Hiromi Kaneko, Mitsukaido; Michiyuki Takagi, Ibaraki, and Kazuhiro Komatsu, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,715
Claims priority, application Japan, Oct. 28, 1981, 56-171431
Int. Cl.³ F01D 3/04
U.S. Cl. 415—104 1 Claim



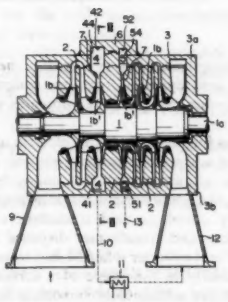
1. An axial thrust balancing system comprising a rotary shaft having an impeller mounted thereon, a sleeve secured to said rotary shaft on the discharge side of said impeller for rotation with the rotary shaft, a bush attached to a casing enclosing the sleeve and juxtaposed against the sleeve, an annular clearance defined between said sleeve and said bush, and at least one annular pressure chamber formed in a surface of at least one of the sleeve and the bush for dividing the clearance axially into a plurality of shorter clearances, said annular pressure chamber having an axial length over thirty-eight times as great as a radial width of said clearance and a depth of over 0.1 times as great as the axial length of the annular pressure chamber.

4,493,611

HORIZONTALLY SPLIT CASING OF TURBO MACHINE

Tadayoshi Funakoshi, and Kazuo Takeda, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 437,360
Claims priority, application Japan, Oct. 23, 1981, 56/168682
Int. Cl.³ F01D 25/24
U.S. Cl. 415—199.1 8 Claims



1. A horizontally split casing of a turbo machine including a plurality of impellers arranged axially of a rotary shaft in a back-to-back relationship in order to provide two sets of compression stages whereby a fluid discharged from a last stage of one set of compression stages is introduced into a first stage of the other set of compression stages and the fluid is discharged from a last stage of the other set of compression stages, a common diaphragm means for the impellers of the last stages of the two sets of compression stages, and defuser means provided for each of the last stage impellers of the two sets of compression stages holding the diaphragm therebetween,

an upper half casing of a welded construction,

a lower half casing of a welded contrustion,

axially extending flanges formed on said upper half casing and said lower casing for enabling the casings to be connected together,

outlet nozzles respectively located at said upper half casing and said lower half casing,

scroll grooves located at one of said upper half casing and said lower half casing in such a manner so as to be connected to said diffusers of said two sets of compression stages for providing outlet scrolls,

cutouts formed in portions of the other half casing corresponding to the outlet scrolls,

a second casing attached to an outer peripheral surface of the other half casing in a manner to enclose said cutouts, and

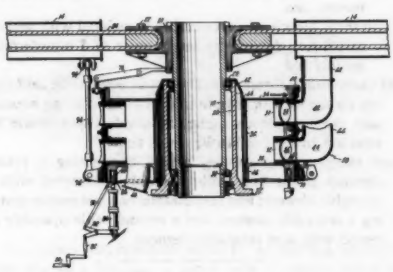
further scroll grooves formed on an inner peripheral surface of said second casing, said further scroll grooves being connected at one end thereof to said scroll groove formed in said one half casing and at the other end thereof to said outlet nozzles, and wherein said further scroll grooves are constructed such that a depth thereof gradually increases in a direction toward said outlet nozzles.

4,493,612

AXIALLY SLIDEABLE PLENUM FOR CIRCULATION CONTROL AIRCRAFT

Frank P. D'Anna, Shelton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1982, Ser. No. 431,476
Int. Cl.³ B64C 27/18
U.S. Cl. 416—20 R 3 Claims

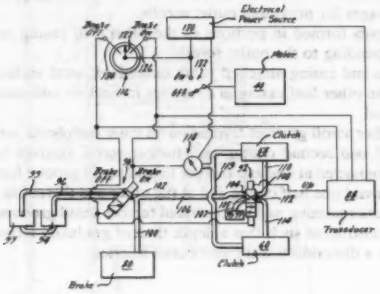


1. An aircraft utilizing a circulation control rotor system having a rotor drive shaft with rotor blades connected thereto and stationary means surrounding and supporting said drive shaft, a pneumatic system for supplying compressed air to said rotor blades including air storage means surrounding said rotor drive shaft, said air storage means including a nonrotating chamber surrounding said stationary means and having means permitting axial sliding with respect thereto and a rotatable chamber surrounding said nonrotating chamber and having means permitting rotary movement with respect thereto, said air storage means including means for admitting compressed air to said nonrotating chamber and means for conducting air from said rotatable chamber to said rotor blades, mechanical collective pitch control means connected to said air storage means to impact axial sliding thereto as the result of blade pitch change inputs and means connecting said air storage means to said rotor blades to change blade collective pitch in response to blade pitch change inputs.

4,493,613
OIL WELL PUMP DRIVE

Gordon M. Sommer, Boca Raton, Fla., assignor to Petroleum Recovery Systems, Inc., Warren, Mich.

Continuation-in-part of Ser. No. 327,718, Dec. 4, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,006
Int. Cl.³ F04B 49/00
U.S. Cl. 417—15 12 Claims



1. An oil well pump assembly including means for pumping oil from an oil well through a well hole comprising a pumping rod and means for reciprocating said pumping rod in said well hole, counterbalance means for reducing the power needed to pump said oil, motor means, means for driving said reciprocating means, and means for driving said counterbalance means, the improvement comprising:

means for engaging said motor means alternately with said reciprocating driving means and said counterbalance driving means comprising:

oil shear clutch means operably associated with said reciprocating driving means to raise said reciprocating means, and

oil shear clutch means operably associated with said counterbalance driving means to raise said counterbalance means; and

oil shear brake means operably associated with said engaging means for stopping both said reciprocating means and said counterbalance means in a selected position for a selected amount of stroke dwell time;

said reciprocating driving means comprising a rotatable element and a first cable operably associated with said rotatable element and said counterbalance means comprising a rotatable element and a second cable operably associated with said rotatable element.

4,493,614
PUMP FOR A PORTABLE VENTILATOR

Raymond D. Chu, Boulder, and Marc A. Bergman, Lafayette, both of Colo., assignors to Lifecare Services, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 433,450, Oct. 8, 1982, abandoned. This application Sep. 27, 1983, Ser. No. 534,988
Int. Cl.³ F04B 49/06, 35/04; A61M 16/00
U.S. Cl. 417—22 24 Claims

1. A pump comprising:

a cylinder capable of containing a fluid and having at least one end wall, said cylinder having fluid inlet and outlet ports;

a piston disposed substantially within said cylinder for substantially, longitudinally reciprocating within said cylinder, the external diameter of said piston being substantially equal to the internal diameter of said cylinder, and said piston provided with an aperture substantially, longitudinally therethrough;

a rotatable shaft extending substantially longitudinally through said cylinder and through the aperture in said piston;

means disposed substantially within said cylinder for reciprocating said piston within said cylinder in response to the rotation of said shaft, said means including means for substantially preventing the rotation of said piston during its reciprocation within said cylinder wherein said rotation preventing means includes a collapsible hinge, and,

means for substantially preventing the flow of any fluid with in said cylinder from one longitudinal side of said piston to the other longitudinal side of said piston when said piston reciprocates within said cylinder.

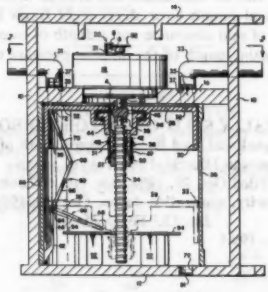
2. A pump comprising:

a cylinder capable of containing a fluid and having at least one end wall, said cylinder having fluid inlet and outlet ports;

a piston disposed substantially within said cylinder for substantially, longitudinally reciprocating within said cylinder, the external diameter of said piston being substantially equal to the internal diameter of said cylinder, and said piston provided with an aperture substantially, longitudinally therethrough;

a rotatable shaft extending substantially longitudinally through said cylinder and through the aperture in said piston;

means disposed substantially within said cylinder for reciprocating said piston within said cylinder in response to the rotation of said shaft;



means for substantially preventing the flow of any fluid within said cylinder from one longitudinal side of said piston when said piston reciprocates within said cylinder; and,

said pump further includes an electric motor for selectively rotating said shaft, a primary electric circuit, a secondary electric circuit operatively connected to said electric motor, and a transformer for transferring energy from said primary circuit to said secondary circuit by magnetic induction, said transformer disposed adjacent to an end wall of said cylinder wherein said transformer is fashioned substantially in the shape of a toroid and wherein siad transformer substantially surrounds said shaft.

9. A pump comprising:

a cylinder capable of containing a fluid and having at least one end wall, said cylinder having fluid inlet and outlet ports;

a piston disposed substantially within said cylinder for substantially, longitudinally reciprocating within said cylinder, the external diameter of said piston being substantially equal to the internal diameter of said cylinder, and said pion provided with an aperture substantially, longitudinally therethrough;

a rotatable shaft extending substantially longitudinally through said cylinder and through the aperture in said piston, said rotatable shaft being provided with a threaded exterior surface;

means disposed substantially within said cylinder for reciprocating said piston within said cylinder in response to the rotation of said shaft, said reciprocating means including a ball nut coupled to said piston and mounted on said shaft such that the ball nut translates along said shaft in response to the rotation of said shaft; and

means for substantially preventing the flow of any fluid within said cylinder from one longitudinal side of said piston to the other longitudinal side of said piston when said piston reciprocates within said cylinder, said flow preventing means including a second nut mounted on said shaft and having a threaded interior surface conforming substantially identically with the shaft threaded surface such that fluid flow along said shaft, between the second nut and said shaft, is substantially prevented and means for mounting said second nut to said ball nut wherein the second nut correspondingly translates integrally with the ball nut as a unit along said shaft in response to the rotation of said shaft.

4,493,615

ELECTRO-RHEOLOGICAL TRANSDUCER

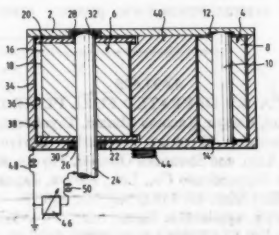
James E. Stangroom, Castleton, England, assignor to National Research Development Corp., London, England

Filed Dec. 2, 1983, Ser. No. 557,581

Claims priority, application United Kingdom, Dec. 3, 1982, 8234634

Int. Cl.³ F04B *37/02*

U.S. Cl. 417—48 **5 Claims**



1. A transducer for use with an electro-rheological fluid characterised in that there is included—

at least two electrically conductive, movable conveying surfaces mutually disposed, in part, in parallel confrontation and defining therebetween a fluid transfer path;

a rotor connected to move with at least one of the conveying surfaces;

two fluid transfer ports each in fluid communication with a respective end of the fluid transfer path; and

an electrical connection means whereby control voltages are applicable to each of the two conveying surfaces.

4,493,616

PUMP ASSEMBLY AND OPERATING METHOD

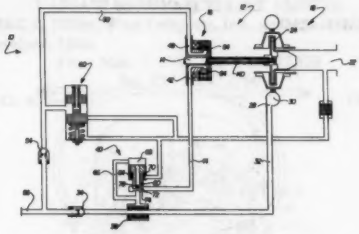
Thomas F. Bergin, Highland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 24, 1982, Ser. No. 422,596

Int. Cl.³ F04B *23/14, 49/00*; F01C *1/00*

U.S. Cl. 417—53 **10 Claims**

1. A pump assembly comprising positive displacement pump means for supplying fluid under pressure to an outlet during operation of the pump assembly at a relatively low speed, said positive displacement pump means including a cam surface, a plurality of vanes, and pressure chamber means for holding fluid pressure to urge said vanes into engagement with said cam surface, centrifugal pump means for supplying fluid under pressure during operation of the pump assembly at a relatively high speed, said centrifugal pump means including a rotatable impeller, and biasing fluid pressure passage means for conducting fluid pressure from the outlet of said positive displacement pump means to said pressure chamber means, said biasing fluid pressure passage means including a passage formed in said



impeller and having a first end portion connected in fluid communication with the outlet of said positive displacement pump means and a second end portion connected in fluid communication with said pressure chamber means.

4,493,617

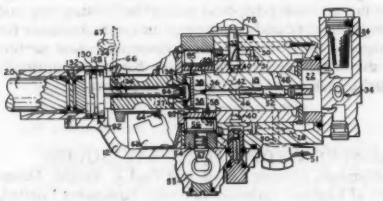
FUEL INJECTION PUMP WITH PLUNGER STROKE CONTROL

C. Eugene Brady, Avon, Conn.; Marcus J. Gottsche, Hampden, Mass., and Paul W. Stoll, West Suffield, Conn., assignors to Stanadyne, Inc., Windsor, Conn.

Filed Mar. 4, 1983, Ser. No. 472,074

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—214 **20 Claims**



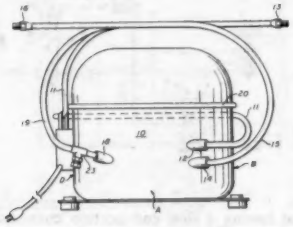
1. In a rotary fuel injection pump for an internal combustion engine having a housing, a rotor with a coaxial drive shaft rotatable in the housing, the rotor having a plurality of radially extending plunger bores and a plunger pump for each plunger bore having a pumping plunger reciprocably mounted in the bore to receive and then deliver a charge of fuel, a cam ring with a cam contour surrounding the rotor and engageable with the plunger pumps to translate the cam contour into reciprocable movement of the plungers, a plunger stroke limit mechanism for limiting the outward stroke of the plungers comprising an abutment member mounted for rotation with the rotor and for axial movement relative to the rotor and having an abutment for each plunger pump engageable by the respective pumping plunger for variably limiting the outward stroke of the plunger in accordance with the axial position of the abutment member and an adjustment mechanism for adjusting the axial position of the abutment member, the improvement wherein the rotor and abutment member have cooperating means permitting radial movement of the abutment member to automatically adjust to different radial displacement of the plungers within their bores.

4,493,618

HANDLE FOR COMPRESSOR UNITS

Eric W. Buzek; Eileen M. Buzek, and Frank R. Buzek, all of 6337 Willowdale, Houston, Tex. 77087

Filed Apr. 18, 1983, Ser. No. 485,460
Int. Cl.³ F04B 21/00
U.S. Cl. 417—234 3 Claims



1. A novel handle means for standard, light-weight refrigeration compressor units, comprising:

(a) a suction line forming an integral part of said handle means, said suction line engaging the suction outlet of said compressor unit, and appropriately encircling said compressor unit to conveniently dispose said suction outlet above and beyond the body of said compressor unit for easy joinder with desired compressor attachments,

(b) a discharge line forming an integral part of said handle means, said discharge line engaging the discharge outlet of said compressor unit, and appropriately encircling said compressor unit to conveniently dispose said discharge outlet above and beyond the body of said compressor unit for easy joinder with desired compressor attachments, and

(c) an oil drainage outlet line, said oil drainage outlet line engaging the oil drainage outlet of said compressor unit, and appropriately encircling said compressor unit to form an integral part of said handle means, said oil drainage outlet line also being disposed with a "tee" fitting near said drainage outlet of said compressor unit so as to enable the drainage of oil from said compressor unit, said suction line, discharge line and outlet line being appropriately bonded together to form a unitary structure.

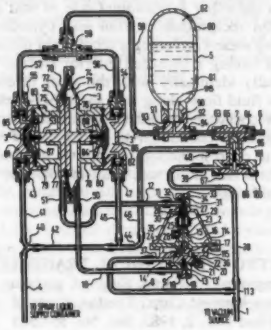
4,493,619

PRESSURE SYSTEMS FOR SPRAY LIQUIDS

Barry R. Marshall, Minster Lovell, and Paul A. Knight, Abingdon, both of England, assignors to Ambic Equipment Limited, Minster Lovell, England

Filed Oct. 28, 1981, Ser. No. 315,875
Claims priority, application United Kingdom, Feb. 10, 1981, 8103966
Int. Cl.³ F04B 49/00
U.S. Cl. 417—307 7 Claims

1. A pressure system for spray liquids comprising a vacuum input line for connection to a vacuum source, a pair of intermediate differential vacuum lines, a differential vacuum line switch powered from the said input vacuum line and operative to provide alternate vacuum pulses in said pair of differential vacuum lines, a spray liquid supply line for drawing spray liquid from a supply container, a spray liquid pressure line, a spray liquid pump driven from said pair of differential vacuum lines, for drawing spray liquid under pressure into said pressure line, a spray liquid pressure reservoir supplied from said spray liquid pressure line and an output spray line from the said reservoir, including a spray liquid pressure release valve having a liquid input connected to said liquid reservoir, a liquid output for returning liquid to said spray liquid supply container and a valve control vacuum line connected to said vacuum input line, said release valve being operative to release spray liquid from said pressure reservoir into said supply container when the pressure in said vacuum input line increases towards atmospheric pressure, in which the spray liquid pressure release valve has a displaceable liquid pressure release member biassed to a position in which the release valve permits return of liquid from the pressure reservoir to said liquid supply container, a chamber sealed by a diaphragm, said diaphragm being in contact with atmosphere on one face and abutting the



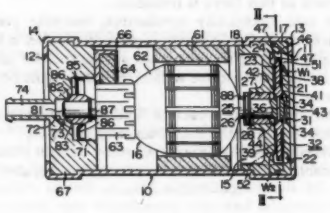
displaceable member on the other face, said vacuum input line being connected, by said control input line and a port, to the interior of said chamber and said displaceable member being urged to its non-release position by differential interior-vacuum and external-atmospheric pressure upon said seal diaphragm.

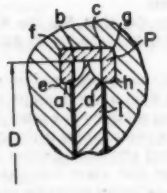
4,493,620

ELECTRICALLY OPERATED FUEL PUMP DEVICE

Toshihiro Takei, Kariya; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Kiyohiko Watanabe, Kariya; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 16, 1982, Ser. No. 358,785
Claims priority, application Japan, Mar. 20, 1981, 56-41096
Int. Cl.³ F04B 35/04; F04D 5/00
U.S. Cl. 417—366 6 Claims





1. An electrically operated fuel pump device for vehicles, comprising a regenerative pump component and an electric

motor component operatively connected to said regenerative pump component to actuate the same to discharge fuel at a pressure of at least 2 Kg/cm^2 and a flow rate of at least 40–150 l/hr, said regenerative pump component comprising:

a pump casing defining therein a pump chamber;

a closed vane type impeller operatively connected to said electric motor component and rotatable within said pump chamber, said impeller having an outer peripheral portion thereof cooperating with said pump chamber to define a pump flow passage, said impeller having in said outer peripheral portion a plurality of vane grooves formed in opposite axial end faces of said impeller in circumferentially spaced relation to each other; and

said impeller having its outer diameter within a range of approximately 20–65 mm, and a flow passage representative dimension defined by S/l being within a range of approximately 0.4–2 mm where S is a cross-sectional area of said pump flow passage and l is a cross-sectional peripheral length of said outer peripheral portion.

4,493,621

FUEL INJECTION PUMPING APPARATUS

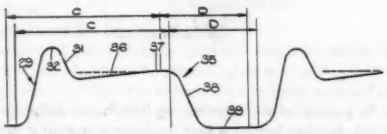
Ivor Fenne, Greenford, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Sep. 28, 1982, Ser. No. 425,964

Claims priority, application United Kingdom, Oct. 30, 1981, 8132742

Int. Cl.^{3} **F04B** *19/02;* **F02M** *39/00*

U.S. Cl. 417—462 **2 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a housing, a rotary distributor member mounted in the housing and arranged to be driven in use, in synchronism with the associated engine, a bore formed in the distributor member and a pumping plunger therein, a delivery passage in the distributor member and a plurality of outlet ports in the housing, said outlet ports in use being connected to means for injecting fuel to the associated engine, said outlet ports being positioned such that the delivery passage registers in turn therewith as the distributor member rotates, inlet port means in the housing, a source of fuel under pressure connected to the inlet port means, inlet passage means connected to said bore, said inlet port means and said inlet passage means being arranged to allow fuel flow to said bore during at least part of the time said delivery passage is out of register with an outlet port, and cam means including a plurality of cam lobes for imparting inward movement to the plunger during part of the time the delivery passage is in register with an outlet port, each cam lobe comprising a leading flank extending to the crest of the lobe and a trailing flank extending from the crest of the lobe, said trailing flank including a first portion adjacent the crest which allows limited outward movement of the plunger, a second portion means and a third portion which extends to a base circle of the cam lobe, said second portion means extending from said first portion for a length substantially greater than said first portion and being directed inwardly to a degree which is gradual as compared to the slope of said first portion for gradually imparting a small and gradual inward movement to the plunger before the delivery passage has moved out of register with an outlet port for slightly and gradually pressurizing the fuel in the pumping apparatus and the outlet ports and collapsing cavities in the fuel contained in the passages in the distributor member and in the outlet ports without causing a rise in fuel pressure in the pumping apparatus significant enough to create pressure waves in the pumping apparatus or in the outlet ports.

4,493,622

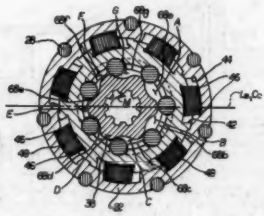
VARIABLE DISPLACEMENT MOTOR

Laurence L. Miller, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 7, 1983, Ser. No. 472,858

Int. Cl.^{3} **F03C** *2/00*

U.S. Cl. 418—57 **13 Claims**



1. A hydraulic motor comprising:

an inlet port for receiving high pressure fluid and an exhaust port for exhausting low pressure fluid,

fluid displacement means comprising relatively rotatable and orbital gerotor gears, said gerotor gears having intermeshing teeth which define fluid chambers that expand and contract as the gerotor gears rotate and orbit relative to each other,

an output shaft,

means coupling one of said gerotor gears with said output shaft for applying a torque to said output shaft as said gerotor gears rotate and orbit relative to each other, and

commutation valve means for directing fluid from said inlet port to some of the fluid chambers defined by said gerotor gears and for directing fluid from other fluid chambers to said exhaust port according to the torque load imposed upon the output shaft,

said gerotor gears defining a center line of eccentricity which separates expanding chambers from the contracting chambers as the gears rotate and orbit,

said commutation valve means having a center line of commutation that separates the fluid chambers that are being communicated with said inlet port from the fluid chambers that are being communicated with said exhaust port as the gears rotate and orbit, and

means associated with said other of said gerotor gears for effecting a change in angular position of said other of gerotor gears with respect to said one of said gerotor gears in response to a change in a torque load on said output shaft for enabling a change in the orientation of the center line of eccentricity of the gear set relative to the center line of commutation of the commutation valve means to thereby change the displacement of said hydraulic motor.

4,493,623

OIL LUBRICATED MAIN DRIVE SHAFT FOR FUEL PUMP

James C. Nelson, Tolland, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Feb. 22, 1983, Ser. No. 468,066

Int. Cl.^{3} **F04C** *1/08*

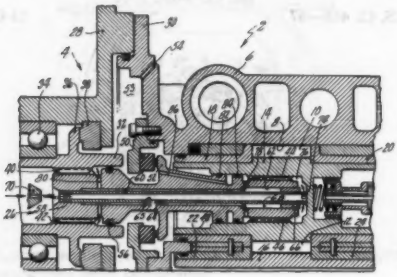
U.S. Cl. 418—94 **4 Claims**

1. In an improved fuel pump adapted to be connected to the gearbox of an engine, the pump being of the type comprising a housing having a pumping cavity therein, a rotating pump component mounted in the pumping cavity and a drive shaft having its outboard and inboard ends in respective engagement

with the gearbox and the rotating pump component, the improvement comprising:

lubricant supply passage means for directing lubricant from the gearbox through the drive shaft to the inboard end thereof;

lubricant return passage means for directing lubricant adjacent to the inboard end of the drive shaft back through the drive shaft to the gearbox;



a pair of spaced seals circumferentially mounted upon the drive shaft in engagement with the rotating component; and

a drain passage in the drive shaft communicating with the outer periphery of the drive shaft at a location between the seals.

4,493,624

LUBRICATING OIL-SEPARATING DEVICE IN A REFRIGERANT COMPRESSOR FOR AIR CONDITIONING SYSTEMS

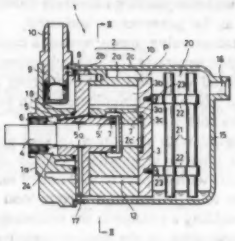
Masahiro Iio, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Aug. 30, 1983, Ser. No. 527,664

Claims priority, application Japan, Sep. 9, 1982, 57-136899[U]

Int. Cl.³ F04C *18/00, 29/02*

U.S. Cl. 418—98 **10 Claims**



1. In a refrigerant compressor for an air conditioning system, including a pump assembly for compressing refrigerant having lubricating oil mixed therein, said pump assembly having at least one pump outlet, at least one discharge valve disposed to close and open said pump outlet, a discharge pressure chamber disposed for communication through said at least one discharge valve with said at least one pump outlet to be supplied with said refrigerant compressed by said pump assembly and discharged through said at least one pump outlet, and a discharge port communicating with said discharge pressure chamber for discharging said compressed refrigerant to the outside of said compressor therethrough, said lubricating oil mixed in said refrigerant being used for lubrication of sliding parts of said compressor,

a lubricating oil-separating device mounted within said discharge pressure chamber for separating said lubricating oil from said refrigerant, said lubricating oil-separating device comprising:

a plurality of tubes substantially vertically disposed within said discharge pressure chamber, said tubes each extending in a direction traversing a flow of said compressed refrigerant discharged through said pump outlet of said pump assembly and flowing in said discharge pressure chamber toward said discharge port, said tubes each having an open lower portion, at least one recess formed in a portion of a peripheral surface thereof facing substantially downstream of said flow of said compressed refrigerant, and an opening formed in said recess and communicating with the interior of said each tube.

4,493,625

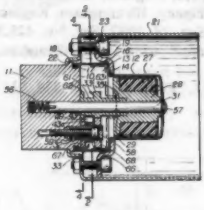
GROOVED GEAR PUMP

Ferdinandus A. Pieters, Concord, Calif., assignor to Micropump Corporation, Concord, Calif.

Filed Aug. 6, 1982, Ser. No. 405,893

Int. Cl.³ F04B *17/00;* **F01C** *1/18, 19/10;* **F04C** *1/08*

U.S. Cl. 418—126 **5 Claims**



1. In a pump of the type having first means defining:

a pump chamber having a face having a planar first surface,

a unitary drive gear and a unitary driven gear in said chamber each having planar second and third surfaces, said second surfaces bearing and sealing against said first surface, said gears meshing together at a mesh point,

second means for driving said drive gear,

an inlet duct in said face,

a concave shoe in said chamber overlying said inlet duct and a portion only of each of said gears including said mesh point,

third means mounting said shoe on said face, said shoe having:

a planar fourth surface sealing against said first surfaces and an outlet duct in said chamber remote from said shoe, the improvement which comprises

a first groove formed in said drive gear extending inward from the tips of the teeth of said drive gear to inside the root diameter of said teeth, the wall of said first groove closest to said second surface defining a planar fifth surface, said first groove dividing the teeth of said drive gear into a pumping first section and a second section,

a second groove formed in said driven gear extending inward from the tips of the teeth of said driven gear to inside the root diameter of said teeth, the wall of said second groove closest to said second surface defining a planar sixth surface, said second groove dividing the teeth of said drive gear into a pumping third section and a fourth section,

said second and fourth sections being located in said chamber,

said shoe further having a seventh surface sealing against portions of said fifth and sixth surfaces on either side of said mesh point,

an arcuate eighth surface sealing against some of the tips of said first and third sections adjacent said mesh point, and

whereby said first surface, said shoe, said first and third

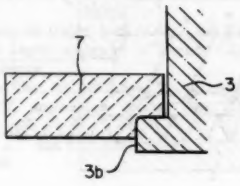
section and the bottoms of said grooves define a closed chamber around said inlet duct separate from said cavity said second and fourth sections being totally separated from said inlet duct by said shoe.

4,493,626

AUXILIARY RADIALLY SHIFTING MECHANISM FOR VANES IN A PUMP OF THE VANE TYPE

Tadashi Nozaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,717
Int. Cl.³ F04C 2/00
U.S. Cl. 418—260 1 Claim



1. In a pump of the vane type having
a cup-shaped cylinder with a suction port and a discharge port,
a rotor eccentrically and rotatably received within said cylinder,
a shaft means for driving said rotor,
a number of vanes radially shiftably disposed within said rotor and adapted to be rotated relative to said cylinder as said rotor rotates so as to have their radially outward ends abut against the inner periphery of said cylinder,
whereby fluid is sucked through said suction port and discharged through said discharge port under a pressure, and
a bracket to close said cylinder at its open end,
wherein the improvement comprises:
an auxiliary radially shifting mechanism for said vanes having a ring-shaped projection, provided on said bracket so as to protrude therefrom into direct radial contact with the vanes over the entire width of the protrusion and to be concentric with said cylinder but to be eccentric with said shaft means, the outer radial peripheral edge of said ring-shaped projection being rounded so that the mechanical strength of the vanes remains superior even if the pump is operating for a long time.

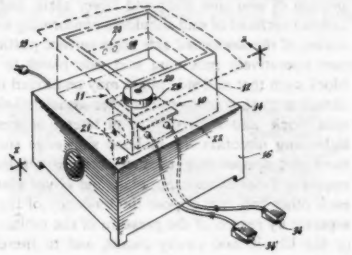
4,493,627

APPARATUS FOR MOLDING FOAM CUSHION PACKAGING

Michael P. O'Malley, Stratford, and Alfred R. Thibault, Naugatuck, both of Conn., assignors to International Packaging Systems Inc., Norwalk, Conn.

Filed Aug. 16, 1982, Ser. No. 408,453
Int. Cl.³ B29D 27/04
U.S. Cl. 425—89 3 Claims

1. A vacuum and air release assembly for use in preforming a molded cushioning packaging material comprising:
a work station adapted to receive a form having the shape of an article to be enclosed within said molded cushioning packaging material,
a housing spaced from said work station to define a space to receive a cushioning foam material to surround said article,
said housing being generally in air tight sealing relationship with respect to said work station,
first blower means operatively associated with said work station to effectively impart a vaccum condition within said housing through an air access port in said work station,
second blower means operatively associated with said work station to blow air into said housing through said air access port,
means for selectively activating said first and second blower means,
means for injecting a foaming cushioning material into said space between said work station and the interior surface of



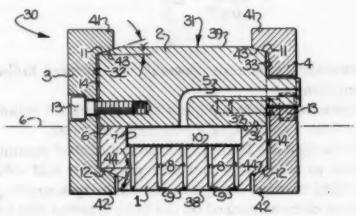
said housing about a separator sheet placed over said form on said work station,
whereby activation of said first blower means evacuates air from within said housing to cause said separator sheet to intimately contact said form so that said cushioning foam material completely surrounds said form and separator sheet in intimate contact therewith and activation of said second blower means after said cushioning foam material has set releases said forming cushioning foam material from contact with said work station.

4,493,628

MELT SPINNING APPARATUS

Erich Lenk, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 512,937
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226479; Oct. 22, 1982, 3239064
Int. Cl.³ B29F 3/04
U.S. Cl. 425—192 16 Claims



8. A melt spinning apparatus adapted for dividing a molten polymer into a plurality of streams to form synthetic filaments, and characterized by the substantial absence of leakage of the polymer, and comprising
a generally rectangular spin block having two opposite sides, said block including a spin plate having a plurality of ducts extending therethrough, and a cover plate overlying said spin plate, said spin plate and cover plate having opposing inner faces defining a transverse plane therebetween and oppositely directed outer faces, each outer face including a side edge surface portion extending along each of the two side edges thereof, with the two side edge surface

portions of at least one of the outer faces being inclined in opposite directions with respect to said transverse plane, said block further including cavity means disposed between the opposing faces of said spin plate and cover plate and communicating with said ducts so as to be adapted for supplying a molten polymer or the like thereto,

a pair of side plates disposed along respective opposite sides of said spin block, each of said plates including a pair of laterally extending shoulders, with each shoulder having a contact surface overlying a respective side edge surface portion of said spin plate and cover plate, and with the contact surfaces of said shoulders conforming to the inclination of the associated side edge surface portions, and

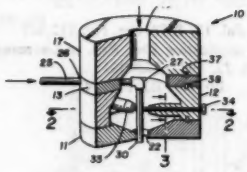
means operatively mounting said side plates to said spin block such that said side plates may be moved in a lateral direction toward or away from the associated side of said spin block, and such that upon lateral movement in a tightening direction the inclined side edge surface portions and cooperating contact surfaces act to bias the opposing faces of said spin plate and cover plate toward each other and thus oppose the tendency of the plates to separate by reason of the pressure of the molten polymer or the like in said cavity means, and to thereby avoid leakage.

4,493,629

MODULAR SPINNERETTE ASSEMBLY

Randal A. Goffe, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1983, Ser. No. 565,264
Int. Cl.³ B29F *3/04*; B29D *23/04, 23/06*
U.S. Cl. 425—192 S **7 Claims**



1. A modular spinnerette assembly for forming hollow fibers, comprising

(a) a spinnerette plate having a central bore for spinning a fiber from a solution of a polymeric material;

(b) a body member having an enlarged central opening for serving as a reservoir and passageway for said solution, said body member being stacked on the spinnerette plate;

(c) a plate element stacked on the boby member and having a central opening for the passage of said solution and also having a radial bore through one side thereof for the passage of a fluid;

(d) a tube leading from the bore in the plate element and terminating in the central bore in the spinnerette plate for injecting a fluid into the bore of the hollow fiber, said member being provided with means for centering the tube in the central bore in the spinnerette plate, said tube and said central bore cooperating to form a hollow fiber; and

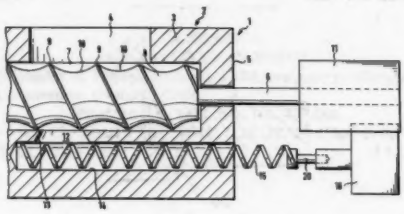
(e) means for holding the spinnerette plate, the body member and the plate element in stacked alignment said assembly having at least one passage, for carrying fluid, which tangentially enters a cavity portion of said assembly.

4,493,630

APPARATUS FOR DEWATERING AND PLASTIFYING MIXTURES FOR THE MANUFACTURE OF EXPLOSIVES

Dietmar Müller, Karlsruhe; Hiltmar Schubert, Walzbachtal, and Rudolf Kröhnert, Ettlingen, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft Zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 496,868
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 3225065
Int. Cl.³ B29F *3/03*
U.S. Cl. 425—203 **6 Claims**



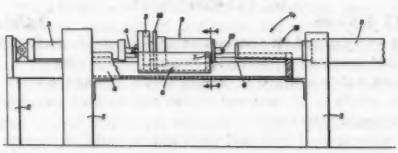
1. Apparatus for dewatering and plastifying a mixture of at least one explosive substance together with a quantity of water and extraneous solids, and comprising a housing having an axially extending extrusion opening and an inlet port in communication therewith for admitting the mixture in its wet condition, a screw extruder provided in said axially extending opening for kneading and conveying the mixture from said inlet port forwardly in a generally axial direction, said housing further including means defining an elongated duct terminating in a drain exterior to the housing, said housing including a drain port passageway connecting said axially extending opening with said elongated duct, said drain passageway diverging in a direction away from the axially extending extruder opening toward said elongated duct, and a helically shaped conveyor coil within said elongated duct, said coil having an interior forward end extending forwardly beyond said drain opening and having an exterior back end extending rearwardly beyond said drain opening and outside the housing, said exterior end adapted to be rotated externally of the housing so that water and solids contained in the water can be carried out of said elongated duct.

4,493,631

APPARATUS FOR PRODUCING VARIABLE-RATE SPRING

J. Robert Dieckmann; Michael L. Lauber, both of Akron, Ohio, and Mark R. Roodvoets, Spartanburg, S.C., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 15, 1983, Ser. No. 532,419
Int. Cl.³ B29C *1/00*; B29H *3/08*
U.S. Cl. 425—292 **8 Claims**



1. Apparatus for producing an elastomeric spring

(1) a cylindrical mold supporting a sleeve,

(2) a first cap closing an end of said mold,

(3) an extrusion nozzle facing the open end of

(4) means to move one of said mold and nozzle coaxially

with respect to the other to position said nozzle within said mold near said first cap,

(5) means to extrusion-fill an elastomer into the sleeve in said mold,

(6) the pressure differential between said moving means and the extrusion-fill separating said mold and said nozzle axially,

(7) means to sever the extrudate at the open end of said mold,

(8) a second cap adapted to close the open end of said mold, said nozzle comprising an outer tube having an inner tube positioned to fit slidably about a stud extending centrally within said mold from said first cap.

4,493,632

SPACER IN METAL-MOLD VULCANIZER FOR RUBBER HOSE

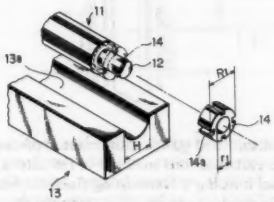
Yoshimi Hori; Takashi Ishida, both of Gifu, and Keizo Hayashi, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Dec. 23, 1982, Ser. No. 452,864

Claims priority, application Japan, Dec. 23, 1981, 56-192076[U]

Int. Cl.³ B29C *1/00*

U.S. Cl. 425—393 **3 Claims**



1. An annular spacer to be used during the vulcanization of an unvulcanized rubber hose in a metal mold having a substantially cylindrical body made of softer material than material of said mold so that said body is prevented from inflicting any damage upon a depression of said mold whereinto said unvulcanized rubber hose is inserted, an outside diameter of said body being greater than an inside diameter of said depression in said metal mold, an inside diameter of said body being greater than a diameter of a mandrel on which said unvulcanized rubber hose is wrapped so that said mandrel may be inserted in said body, said body defining grooves formed parallel to the axial direction of said spacer and extending into at least said outer surface of said body permitting gas, escaping from within said mold and said body, to be deflected toward said grooves during the vulcanization of said unvulcanized rubber hose.

4,493,633

APPARATUS FOR MOULDING AN ARTICLE FROM PLASTIC MATERIAL

Kjell M. Jakobsen, Skanör; Claes T. Nilsson, Löddeköpinge, and Lars G. Larsson, Höör, all of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

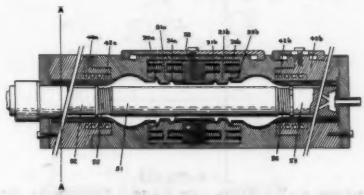
Division of Ser. No. 196,374, Oct. 14, 1980, Pat. No. 4,409,176. This application Jan. 14, 1983, Ser. No. 457,887

Claims priority, application Sweden, Jan. 30, 1980, 8000722

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—525 **15 Claims**

1. Apparatus for molding an article from a tube-shaped parison of thermoplastic material having an oriented portion which is of relatively high strength and resistant to stretching, said apparatus comprising mold means including a wall with a cylindrical mold surface provided with a plurality of axially spaced recesses therein, means for applying internal pressure to the parison to bring a plurality of regions of the oriented portion of the parison into contact with said cylindrical mold surface in axially spaced regions of the mold means adjoining said recesses such that the parison extends across the recesses without entering into contact with the mold wall at said recesses, means for relatively displacing said axially spaced regions of said mold means in axial direction to axially shift the plurality of axially spaced regions of the parison while concurrently applying the internal pressure to said parison and reducing the axial extent of said recesses to a final position in which said recesses are of ring-shape with a defined cross-sectional profile, the relative axial displacement of said regions of said mold means in combination with the reduction of the axial extent of the recesses and the internal pressure applied to the parison



causing said regions of the parisons in contact with the mold wall under the application of internal pressure to be correspondingly relatively axially displaced with said regions of the mold means while the portions of the oriented portions of the parison extending across said recesses are shaped into said recesses under said internal pressure, and means for halting the relative displacement of said axially spaced regions of the mold means substantially when said portions of the parison have entered said recesses and assumed the shape of said recesses in said final position without substantial stretching and change in wall thickness of said portions of said parison to form a hollow ring-shaped profile on said article.

4,493,634

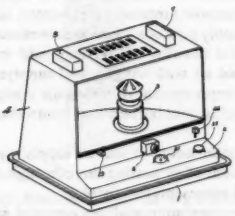
KEROSENE HEATING STOVE WITH TEMPERATURE AND CARBONIC OXIDE SENSORS

Jerry S. C. Yang, 5-1 Tay Pyng St.,, Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed Apr. 28, 1982, Ser. No. 372,829

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—33 **11 Claims**



1. An apparatus for heating a space, said apparatus comprising:

reservoir means for storing a quantity of combustible liquid;

wick means for producing a flame by burning said combustible liquid, a first portion of the length of said wick means being adapted for immersion into said combustible liquid, a second portion of the length of said wick means being adapted for burning said combustible liquid to produce said flame;

temperature sensing means for producing a signal indicative of the temperature of the air in said space; and

temperature regulating means, responsive to said tempera-

ture-indicative signal, for adjusting the height of said wick means in order to change the height of said flame so as to maintain constant temperature of said air in said space, said temperature regulating means, also reducing the height of said wick means to decrease the height of said flame in response to a warning signal;

carbonic oxide sensing means for producing said warning signal when the level of carbonic oxide produced by said flame accumulated in said space exceeds a predetermined level dangerous to a user; and

movable lid means, responsive to said warning signal, for covering said wick means to extinguish said flame when said warning signal is produced.

4,493,635

OXYGEN-ENRICHED AIR RATIO CONTROL DEVICE FOR COMBUSTION APPARATUS

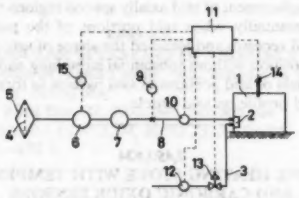
Hirosato Ito, and Daizo Takada, both of Osaka, Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Feb. 10, 1983, Ser. No. 465,679

Claims priority, application Japan, Feb. 27, 1982, 57-27900[U]

Int. Cl.³ F23N *3/08*

U.S. Cl. 431—90 **2 Claims**



1. In a combustion apparatus of the type including a burner for burning combustion fuel and oxygen-enriched air, a fuel supply pipe for supplying combustion fuel to said burner, oxygen-enriched air generating means including an oxygen permeable selective membrane, an air supply pipe extending from said generating means to said burner, and a vacuum pump in said air supply pipe at a location downstream of said generating means for drawing air through said membrane, thereby enriching said air with oxygen, and supplying said air to said burner, the improvement of means for controlling the air-fuel ratio supplied to said burner, said controlling means comprising:

air flow meter means at said air supply pipe for determining the amount of air passing therethrough and for generating a signal representative thereof;

oxygen concentration analyzer means at said air supply pipe for determining the concentration of oxygen in said air passing therethrough and for generating a signal representative thereof;

fuel flow meter means at said fuel supply pipe for determining the amount of fuel passing therethrough and for generating a signal representative thereof; and

means, responsive to said signals from said air flow meter means, said oxygen concentration analyzer means and said fuel flow meter means, for calculating the actual air-fuel ratio supplied to said burner, and operatively connected to said vacuum pump for controlling the operation thereof to adjust said actual air-fuel ratio to equal a predetermined air-fuel ratio.

4,493,636

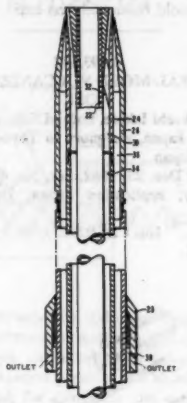
GASIFICATION SYSTEM

Gaurang B. Haldipur, Hempfield; Richard G. Anderson, Penn Hills, and Peter Cherish, Bethel Park, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 240,654, Mar. 5, 1981, Pat. No. 4,391,611. This application Mar. 11, 1983, Ser. No. 474,360

Int. Cl.³ F23D *19/02*

U.S. Cl. 431—170 **9 Claims**



1. A fluidized bed gasification reactor of the type wherein particulate carbonaceous material is fed into a vertically disposed vessel housing a combusting fluidized bed to produce a combustible product gas and ash, comprising:

a first vertical cylindrical tube extending upwardly into said vessel and having an open upper end;

means for flowing a first fluid upwardly through said first tube and into said vessel;

a second vertical tube, having an open upper end, and concentric with and spaced about said first tube so as to form an inner annulus therebetween; said first and second tubes forming an annular passage of substantially constant cross-section over a substantial portion at their ends, said passage extending radially outwardly and at an angle of greater than 0° and less than 7½°;

means for flowing a second fluid upwardly through said inner annulus and into said vessel;

a third vertical tube, having an open upper end, and concentric with and spaced about said second tube so as to form a second annulus;

means for flowing a third fluid upwardly through said second annulus and into said vessel; and

wherein said second and third tubes are tapered to form narrowed upper ends.

4,493,637

FOSSIL FUEL CATALYST GENERATOR

Robert Ganter, Mount Penn; Robert Whitmoyer, Selins Grove, and Palle Rye, Shillington, all of Pa., assignors to Thermics Corporation Liquidating Trust, Mount Penn, Pa.

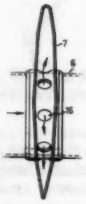
Continuation of Ser. No. 287,014, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 12,411, Feb. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 878,130, Feb. 15, 1978, abandoned. This application Mar. 14, 1984, Ser. No. 589,041

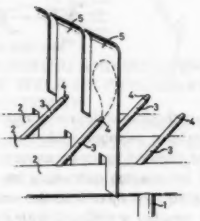
Int. Cl.³ F23J *1/00*

U.S. Cl. 431—190 **10 Claims**

1. An apparatus for introducing a catalyst into a fuel-air mixture for combustion in stationary combustion apparatus comprising:

a container for holding water;
means for passing air through water in said container to produce processed air;
means for removing substantially all moisture in the form of mist from said processed air to produce processed air prior to removing said processed air from said container; and
means for removing said processed air from said container and for introducing said processed air removed from said container into a fuel-air mixture of stationary combustion apparatus, said means for removing substantially all moisture includes a baffle secured to the uppermost portion of said container upstream of and communicating with a container outlet, said baffle comprising a pair of plates having peripheral portions extending outwardly and downwardly from central portions thereof, said plates being spaced one above the other and attached together by radial vanes secured between said plates, said upper plate having means surrounding an opening for securing said baffle to said container adjacent said outlet, wherein a space is formed between said plates, said vanes and said securing means provides a tortuous path for processed air being removed from said container whereby substantially all moisture in the form of mist contained in said processed air is removed from said processed air.





4,493,638

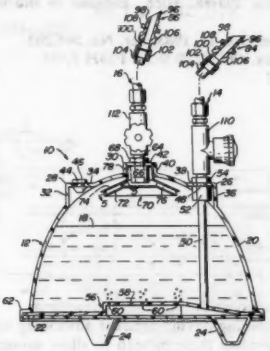
POST-AERATED BURNER FOR GROUND FLARE, AND GROUND FLARE INCORPORATING SAME

Roger S. Scammell, Yarmouth, England, assignor to The British Petroleum Company, p.l.c., London, England

Filed Feb. 12, 1982, Ser. No. 348,228
Claims priority, application United Kingdom, Feb. 18, 1981, 8105121
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—202 **17 Claims**

1. A burner comprising:
(a) a plurality of horizontally disposed fuel gas supply pipes;
(b) said supply pipes being streamlined to provide a relatively low resistance to upward air flow;
(c) each pipe having fuel gas outlets in the form of jets in the downstream face of the pipe;
(d) there being a plate adjacent to each jet,
(e) the jets and plate being adapted to give an angle of fuel gas impingement on the plate of from 1° to 55° so as to mix the fuel gas and surrounding air on the plate;
(f) the plate also having means for flame retention; and
(g) means for passing air upwardly past the jets and plates.

17. A burner comprising a fuel gas supply pipe being streamlined so as to present low resistance to upward air flow, the pipe having one or more outlets, a plate adjacent and at an angle to each outlet whereby the angle of fuel gas impingement on the plate is at an angle of 1° to 55°, means for passing air upwardly past the outlets and plates, and means for retaining the flame resulting from combustion of the fuel gas and air, said flame retaining means comprising the upper edge of the plate inclined into a horizontal position towards the fuel gas outlet.

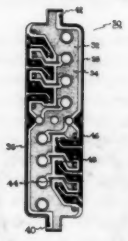


4,493,639

CONDUCTIVE INK FOR FLASHLAMP ARRAY CIRCUIT

Mary E. Suster, Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 489,870, May 6, 1983, , which is a continuation of Ser. No. 205,412, Nov. 10, 1980, abandoned. This application Jan. 13, 1984, Ser. No. 570,415
Int. Cl.³ F21K *5/00*; H01B *1/06*; G03B *15/02*
U.S. Cl. 431—359 **3 Claims**

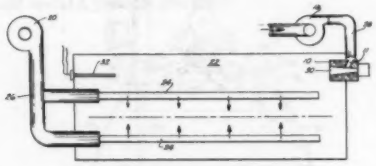


1. An improved photoflash array having a plurality of high voltage type flash lamps connected to a lamp firing circuit pattern deposited on a circuit board with radiation-sensitive switches being connected in said circuit pattern for sequential firing of said flash lamps, wherein the improvement comprises using a non-metallic conductive ink coating for said circuit pattern which is a mixture containing at least 25% by weight in the dry solid coating of powdered carbon with up to approximately 50% by weight in said dry solid coating of a particulated electrically conductive material selected from the group consisting of graphite flakes and conductive carbon, along with an organic polymer binder, said conductive ink exhibiting greater electrical conductivity together with increased electrostatic flash out protection of the flash lamp being provided by combination of said conductive ink with common electrical

grounding circuit means having greater width than the width of the circuit pattern being employed to apply firing pulses to the associated flash lamps.

4,493,640
SOLVENT REDUCING OVEN

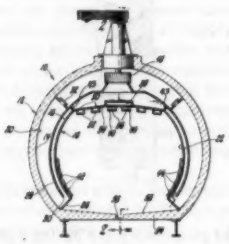
Lester A. Hanson, Parma, Mich., assignor to Blu-Surf, Inc., Parma, Mich.

Filed Oct. 21, 1983, Ser. No. 544,203
Int. Cl.[3] F27B 9/28; F24H 1/00
U.S. Cl. 432—72 6 Claims

1. A solvent reducing drying oven comprising:
an elongated housing having product advancing means for conveying product therethrough to allow solvents to be driven off the product;
burner means with its discharge oriented into said oven for combusting solvents and supplying the resultant heat to said oven;
vaporized solvent ducting and advancing means from said housing for advancing vaporized combustible solvents from said housing, including passages into said burner means oriented at an acute angle toward and relative to the discharge outlet from said burner means for pressurized combustion of the solvents, and transfer of the resultant heat to said oven.

4,493,641
BAKE OVEN WITH MANIFOLD

Gordon F. Hubbert, Plymouth, Mich., assignor to Gladd Industries, Inc., Plymouth, Mich.

Filed Jan. 9, 1984, Ser. No. 569,500
Int. Cl.[3] F27B 9/00, 3/22
U.S. Cl. 432—120 17 Claims

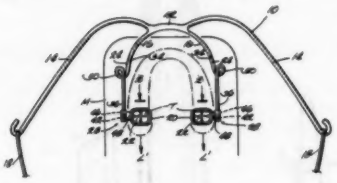


1. A paint bake oven (10) comprising: an outer insulated housing (12) including an inner wall surface (14); an inner housing (16) disposed within said outer housing (12) and having an outer wall surface (18) spaced from said inner wall surface (14) to define a gas flow channel (20) therebetween, said inner housing (16) having an inner product passageway (22); gas supply means (24) disposed above said inner housing (16) for supplying a gas flow to said gas flow channel (20); gas exhaust means for exhausting gas from said product passageway (22); and characterized by gas flow control means for directing the gas flow along a flow path from said gas supply means (24) downwardly along said inner wall surface (20) of said outer housing (12) and then upwardly over said outer wall surface (18) of said inner housing (16) to uniformly distribute the gas flow over said inner housing (16).

4,493,642
ORTHODONTIC DEVICE AND ASSOCIATED ORTHODONTIC METHOD

Glendon J. Bogdon, 3044 S. 92nd St., Milwaukee, Wis. 53227

Filed Dec. 27, 1982, Ser. No. 453,460
Int. Cl.[3] A61C 7/00
U.S. Cl. 433—5 31 Claims

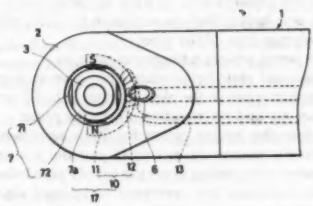


1. An orthodontic device comprising
a face bow member including generally diverging outer arms adapted for connection to an orthodontic headpiece and inner arms extending between said outer arms and adapted to project into the mouth of the user.
a first member associated with each of said inner arms,
first means connecting each of said first members to said associated inner arm for imparting to each of said first members a generally horizontal force directed outwardly toward the cheek side of the user's mouth, and for rotation of each of said first members about an axis fixed relative to said associated inner arm,
a second member associated with each of said first members, each of said second members being adapted for engagement with a tooth, and
second means removably connecting each of said second members to said associated first member for imparting to each of said second members said generally horizontal force imparted to said associated first member, and for transmitting rotation of said first member into arcuate movement of said second member about said axis, whereby arcuate movement of each of said second members applies a rotational force to the tooth and serves to tip the root of the tooth engaged by said second member in the direction of said arcuate movement.

4,493,643
DENTAL HANDPIECE HAVING NON-CONTACT ROTATIONAL SPEED DETECTION DEVICE

Akifumi Tachibana, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Dec. 30, 1982, Ser. No. 454,687
Claims priority, application Japan, Feb. 9, 1982, 57-17979
Int. Cl.[3] A61C 1/00, 3/00
U.S. Cl. 433—27 5 Claims



1. A dental handpiece having therein a non-contact rotational speed detection device, which device comprises:

cylindrical rotor made of a magnetic material provided with discontinuities around its circumference: and

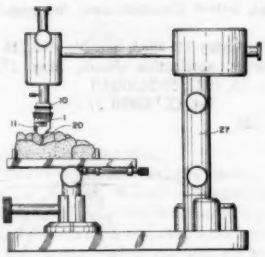
an electromagnetic induction pulse generator comprising a permanent magnet provided close to said cylindrical rotor in a head of said dental handpiece and a coil wound around said permanent magnet, whereby the pulse generator generates an induction voltage proportionate to the product of the number of said discontinuities and the rotational speed;

4,493,644

DEVICE FOR MEASURING AND SCRAPING OPERATIONS IN THE FIELD OF PRESTORATIVE DENTISTRY

Minoru Ai; Akira Manabe, both of Tokyo; Yoshimasa Igarashi, Sagamihara, and Katsuya Mizuno, Tokyo, all of Japan, assignors to Sankin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,000
Claims priority, application Japan, Nov. 5, 1982, 57-193526
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—75 **9 Claims**



1. In a device for measuring an inclination angle of the tapered surface of a plaster die duplicated from the prepared tooth, said plaster die being mounted on a surveyor utilized in the "conus crown" telescope technology, and scraping a wax pattern on the plaster die so as to fabricate a tapered conical crown with an adequate inclination angle to retain a partial denture, the improvement consisting in that said device essentially comprises;

a rotary ring having a lower end face which is cut to a predetermined inclination angle, said rotary ring having a number of calibration lines impressed over the peripheral surface thereof,

core means onto which said rotary ring is rotatably fitted, tool holding means inserted into the core means so as to turn about a support shaft, said tool holding means having a pair of lateral projections each of which upper face extends at the same inclination angle as that of the lower inclined end face of the rotary ring,

a lock ring for inhibiting rotation of the rotary ring when the tool holding means is to be fixedly held,

resilient means for normally thrusting downward the rotary ring so that the lower inclined end face of the rotary ring comes in slidable contact with both the upper faces of the lateral projections of the tool holding means, and

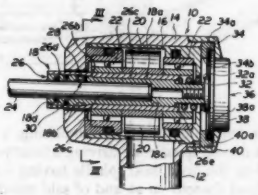
fitting means firmly fitting the device to the surveyor, said fitting means serving also as a cover for the device.

4,493,645

DEVICE FOR OPENING AND CLOSING A CHUCK FOR A DENTAL HANDPIECE

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg., Co., Ltd., Kanuma, Japan

Filed Jun. 30, 1983, Ser. No. 509,809
Claims priority, application Japan, Jul. 2, 1982, 57-101183
Int. Cl.³ A61C *1/14*
U.S. Cl. 433—127 **7 Claims**



1. A dental handpiece having means for opening and closing a chuck, comprising:

a handle portion;

a powerhead assembly supported on said handle portion;

a hollow driving shaft having a plurality of radial turbine blades around the periphery thereof and journalled only for rotation in said handle portion, said driving shaft having adjacent a forward end a large diameter front portion and a small diameter rear portion and a forwardly outwardly tapering portion joining said front and rear portions;

a hollow cylindrical chuck axially slidably positioned in said hollow driving shaft, said cylindrical chuck having a large diameter front peripheral surface and a small diameter rear peripheral surface and a forwardly outwardly tapering outer peripheral surface joining said front and rear peripheral surfaces, said surfaces corresponding to said large diameter front portion, said small diameter rear portion and said forwardly outwardly tapering portion, respectively, said cylindrical chuck having a plurality of radial openings opening through said forwardly outwardly tapering surface at equally spaced positions thereabout;

a disc-shaped chucking die slidably positioned in each said radial opening and having a peripherally stepped flat bottom portion projecting slightly into the interior of said cylindrical chuck;

a helical compression spring around said cylindrical chuck and having one end engaged with a rear portion of said cylindrical chuck and the other end engaged with a rearwardly facing surface of said driving shaft for urging said cylindrical chuck rearwards; and

a chuck pusher in said powerhead assembly at the rear end of said cylindrical chuck and normally disengaged from said cylindrical chuck and engageable with said cylindrical chuck for sliding said cylindrical chuck within said driving shaft against said helical spring to release said chucking dies.

4,493,646

DEVICE FOR FIXING A TRANSMISSION ASSEMBLY IN THE BODY OF AN ANGLED DENTAL TOOL

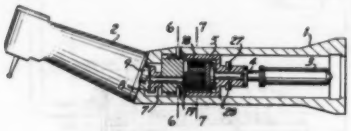
Bernard Lacour, 16 Chemin de Brulefoin, 25000 Besancon; Hubert Euvrard, Chemin du Moulin, Auxon Dessus, 25870 Geneuille; Roger Gaillard, Busy, 25320 Montferrand le Chateau, and Jean C. Boinot, 22 H, rue de Fontaine Ecu, 25000 Besancon, all of France

Filed Jul. 26, 1982, Ser. No. 401,611

Claims priority, application France, Aug. 3, 1981, 81 15144; Dec. 1, 1981, 81 22616

Int. Cl.³ A61C 1/12

U.S. Cl. 433—133 **1 Claim**



1. A contra angle combination comprising, a contra angle head having a driven spindle for driving a rotary-driven dental tool mounted on the head, said spindle having a driven pinion gear rigidly fixed thereto on an end of said spindle for receiving driving input thereto to rotate said spindle, a drive transmission assembly having a driving shaft with an end pinion gear rigidly fixed thereto for meshing only with several teeth thereof with some teeth of the first-mentioned pinion gear, when the transmission assembly is coupled to the contra angle head and is at rest, the axes of rotation of said first-mentioned gear being at an oblique angle so that only partial meshing occurs when said drive transmission assembly is coupled to said contra angle head, and is at rest, an elongated housing having a socket for receiving and housing the drive transmission assembly, a bayonet coupling releasably holding the drive transmission assembly in said socket of said housing, a second bayonet coupling for detachably coupling said housing to said contra angle head, said drive transmission shaft having an externally toothed element at an opposite end to the pinion gear thereon, an internally toothed element fitting over and circumferentially of the externally toothed element for detachably coupling thereto, and another shaft fixed to said internally toothed element and extending axially therefrom for driving the internally toothed element thereby to drive the pinion gear connected to said drive transmission, whereby the pinion gears can be driven at speeds only partially dependent on the gear ratio between the pinion gears.

4,493,647

WEATHER RADAR SIMULATOR

Dennis A. Cowdrey, Pulborough, England, assignor to The Singer Company, Binghamton, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,710

Claims priority, application United Kingdom, Jul. 30, 1981, 8123416

Int. Cl.³ G01S 7/24

U.S. Cl. 434—2 **5 Claims**

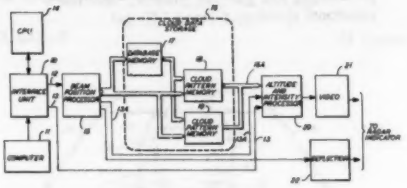
1. A weather radar simulator, comprising:

beam positioning means arranged in operation to generate for each of a plurality of directions of a simulated radar beam, address signals representing the spatial coordinates of points on the simulated radar beam;

storage means for storing weather information in respect of cells of a region in which the radar beam is assumed to propogate;

the stored information being addressed by said address signals for read-out of said weather information in respect of cells through which the beam passes;

said storage means comprises first storage means with storage locations, addressed by the higher order parts of the address signals, each containing a code word specifying a weather pattern for a respective multicell location of the region, second storage means with a plurality of groups of memory locations, each group having memory locations each containing weather information in respect of a respective cell, and addressing means responsive to code words read from said first storage means to select a corresponding one of the groups and responsive to the lower order parts of said address signals to select a cell with that group; and



processing means responsive to the read-out weather information to calculate, for each beam direction, the corresponding beam attenuation to form a video signal for supply to a radar display indicator.

4,493,648

TERRESTRIAL GLOBE

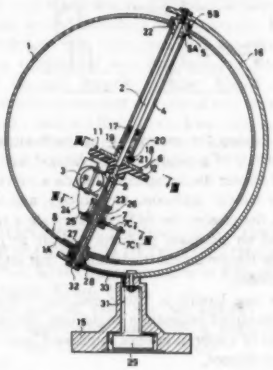
Hajime Suzuki, 5-39-9 Kamikitazawa, Setagaya-ken, Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,718

Claims priority, application Japan, May 17, 1982, 57-70615[U]; Mar. 15, 1983, 58-36306[U]

Int. Cl.³ G09B 27/08

U.S. Cl. 434—136 **4 Claims**



1. In a support for a rotatable globe, particularly a terrestrial globe, of the type including:

a support;

a pivot carried by the support;

a globe supported by the pivot;

a stationary shaft carried by said support and extending into the globe through an aperture therein;

a drive motor positioned within said globe and supported by said stationary shaft;

a drive member positioned within said globe and journaled for rotation about said stationary shaft, the drive member being driven by said drive motor; and,

means for interconnecting said drive member and said globe

and supporting said globe for rotation about a diametral axis thereof upon energization of said drive motor;

the improvement comprising:

switching means for said motor associated with said drive member and which is actuated to energize said motor upon manual rotation of said globe in a forward direction, and, which is actuated oppositely to de-energize said motor upon reverse manual rotation of said globe.

4,493,649

COLLAPSIBLE GLOBE ASSEMBLY

Wen H. Toung, No. 106, Teh-An St., Chu-Tong Cheng, Hsin-Chu, Taiwan

Filed Feb. 7, 1983, Ser. No. 464,665

Int. Cl.³ G09B *27/08*

U.S. Cl. 434—138 **4 Claims**

1. A globe assembly comprising:

a hollow sphere of flexible material having two inflating passages on the wall thereof at diametrically opposite positions; two plug members for obstructing said passages, said plug members each including a pin member; a bowed support arm having end portions with pin holes for receiving said pin members for rotation therein; a stand for supporting said bowed support arm; a driving mechanism provided at a lower end portion of said bowed arm and having an output shaft; and a pair of gears mounted respectively to said output shaft and said pin member at the lower end of said bowed arm, said gears being engageable and disengageable from each other; whereby the sphere can be rotated either by hand or by the driving mechanism.

4,493,650

FOLD-OUT GARMENT BOOK

F. William Kaufmann, III, and Alan Zwiebel, both of New York, N.Y., assignors to Random House, Inc., New York, N.Y., a part interest

Filed Feb. 17, 1984, Ser. No. 581,399

Int. Cl.³ G09B *17/00*; B42D *1/00*

U.S. Cl. 434—178 **12 Claims**

1. A fold-out garment book comprising a sheet folded to define a plurality of panels which form pages of a book, said pages including printing thereon in a predetermined sequence, said sheet being unfolded as said pages are viewed in sequence, said unfolded sheet including an opening therein to permit wearing of said sheet as a costume, said panels presented when said sheet is worn in unfolded condition including printing

thereon to define said costume, whereby a book which unfolds to a costume is provided.

4,493,651

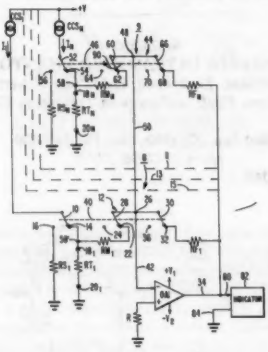
STATISTICAL TEACHING APPARATUS

Allan E. White, Hightstown; David E. Coleman, Kendall Park, and Steven R. Miller, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,272

Int. Cl.³ G09B *19/00*

U.S. Cl. 434—188 **10 Claims**



1. A statistical teaching apparatus for statistically evaluating a plurality of elements comprising:

means for selectively measuring a given characteristic of one or more selected elements of a selected group of said elements;

means for selectively averaging said measured characteristics of said elements in said selected group;

means for selectively coupling said one or more elements to said means for measuring and to said means for averaging to respectively measure the characteristic of any selected element and to provide the average of the characteristics of said selected group; and

means for indicating the measured value of said selected

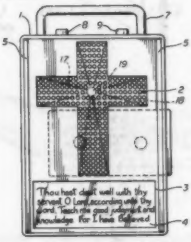
element characteristic and the average of said characteristic values of said selected group.

4,493,652

INSPIRATIONAL TEACHING APPARATUS

Nettie Mike, Rte. 4, Box 66B, Hammond, La.

Filed Apr. 21, 1983, Ser. No. 487,022
Int. Cl.³ G09B *19/00*; G09F *19/00*
U.S. Cl. 434—245 **9 Claims**



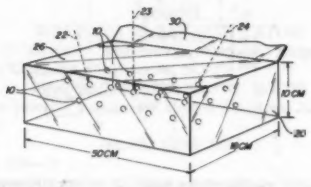
1. A device for teaching a person inspirational verses comprising:
- a housing;
- shutters pivotally connected to said housing;
- exhibiting means mounted in said housing behind said shutters for showing a seemingly mobile inspirational symbol upon opening of said shutters;
- display means located behind said shutters for exhibiting a selected one of a plurality of inspirational phrases;
- audio means in said housing to verbalize said displayed inspirational phrase; and
- system control means for changing from said selected displayed inspirational phrase to another inspirational phrase, for closing and opening said shutters, for exhibiting said inspirational symbol, for displaying said inspirational phrase, and for actuating said audio means.

4,493,653

BIOPSIABLE ULTRASOUND PHANTOM

Cheston W. Robbins, Englewood, Colo., and Robert M. Kelly, Mountain View, Calif., assignors to Technicare Corporation, Solon, Ohio

Filed Sep. 27, 1983, Ser. No. 536,419
Int. Cl.³ G09B *23/28*
U.S. Cl. 434—262 **12 Claims**



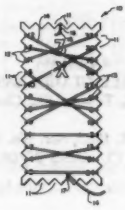
1. A phantom for ultrasonic imaging and suitable for simulating a biopsy procedure comprising:
- a main structure of tissue equivalent material which exhibits acoustic properties resembling those of human tissue, and through which a biopsy needle may be inserted and ultrasonically imaged during a simulated biopsy procedure; and
- at least one relatively smaller body, suspended within said main structure of tissue equivalent material, and formed of an outer casing containing a substance which may be aspirated during a simulated biopsy procedure, said body representing a tissue mass viable for biopsy and exhibiting acoustic properties resembling those of such a tissue mass during ultrasonic imaging.

4,493,654

EDUCATIONAL DEVICE

Marion W. Stuart, 2122 E. 6550 South, Uintah, Utah 84405

Filed Apr. 2, 1984, Ser. No. 595,719
Int. Cl.³ G09B *3/12*
U.S. Cl. 434—347 **9 Claims**



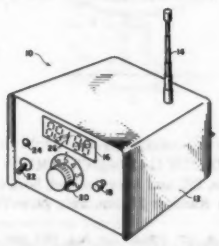
1. Educational device for teaching informational relationships, comprising in combination:
- card means having at least two mutually opposing edges, a face and a rear side, each edge having a plurality of notches along the length thereof;
- a plurality of problems arranged respectively next to said notches along one of said opposing edges of the face of said card;
- a plurality of answers arranged respectively next to said notches along the opposite one of said opposing card edges, said answers comprising correct solutions to each of said corresponding problems on the opposing card edge;
- elongate string means for extending from a notch on one edge to another notch on the opposing edge of said card means; and
- a plurality of line indicators on said rear side of said card corresponding to the placement of said string means across said card rear side representing the correct answers to said problems.

4,493,655

RADIO-CONTROLLED TEACHING DEVICE

James W. Groff, P.O. Box 38, Morgan Hill, Calif. 95037

Filed Aug. 5, 1983, Ser. No. 520,705
Int. Cl.³ G09B *7/00*
U.S. Cl. 434—351 **12 Claims**



1. A radio-controlled teaching device comprising in combination: a teacher transmitter unit containing tone generation means, timing means associated with and controlling the duration of tones generated by said tone generation means, manual switching means operatively connected to said timing means for actuating said timing means and said tone generation means

at selected points during oral reading of textual material or test material, counting and readout means operatively associated with said timing means for counting and displaying the number of times said tone generation means are actuated, manual reset means operatively connected to said counting and readout means for selectively resetting said readout means to zero, and a radio transmitter operatively coupled to the output of said tone generation means for transmitting tones generated by said tone generation means; and a plurality of portable student receiver units containing a battery power supply, a radio receiver tuned to the carrier frequency of said transmitter, a tone decoder operatively connected to the output of said radio receiver, a first timing means operatively connected to and actuated by the output of said tone decoder for providing a short time period during which a student is expected to respond at said selected points during oral reading of textual or test material, a response switch which is momentarily closed by the student at said selected points during oral reading of textual or test material, a second timing means operatively connected to and actuated by said response switch for providing a brief time period when said response switch is closed, a first logic gate and a second logic gate operatively connected to said first and second timing means wherein a "right" pulse is conducted by said first logic gate when said response switch is momentarily closed during said short time period of said first timing means and, wherein a "wrong" pulse is conducted by said second logic gate when said response switch is momentarily closed when said short time period of said first timing means is not occuring, a third timing means operatively connected to the outputs of said first logic gate and second logic gate and actuated by said "right" pulse or "wrong" pulse for momentarily disabling said second timing means and said first logic gate and second logic gate when said response switch is momentarily closed, a first counter operatively connected to the output of said first logic gate, whereby a said "right" pulse advances said first counter one count when said "right" pulse occurs, a second counter operatively connected to said second logic gate, whereby said "wrong" pulse advances said second counter one count when said "wrong" pulse occurs, first decoder/drivers and liquid crystal readouts operatively connected to the outputs of said first counter for displaying the current count of said first counter, and second decoder/drivers and liquid crystal readouts operatively connected to the outputs of said second counter for displaying the current count of said second counter.

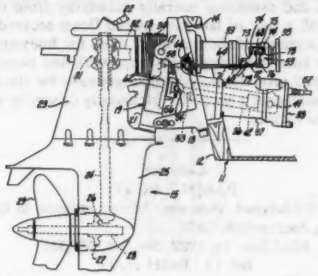
4,493,656

TILT-UP ANGLE SENSING SYSTEM FOR INBOARD-OUTBOARD DRIVES

Seiji Inoue, and Norimichi Harada, both of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Continuation of Ser. No. 378,849, May 17, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,952
Claims priority, application Japan, Jun. 26, 1981, 56-99478
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—2 **5 Claims**

1. A position sensing unit for an outboard drive to indicate its angular position relative to the transom of a boat including power means for adjusting the angular position of the outboard drive comprising sensing means comprising a sensing abutment member carried by said outboard drive and movable therewith, angle reading means positioned on the opposite side of said transom from said sensing means, said angle reading means comprising an input element supported for movement and a signal producing element for providing a signal indicative of the position of said input element, and connecting means comprising a slidably supported element passing through the transom and independent of the power means for transferring a position signal to said input element, said slidably supported element having a first end abuttingly engaged with said abutment member, and means providing a mechanical connection between said input element and the end of said slidably supported element for positioning said input element of angle



reading means in response to the position of said sensing abutment member.

4,493,657

DEVICE FOR CONVERTING A CYCLE INTO A TREADLE-OPERATED WATER CYCLE

Ernst Zeitler, Linnestrasse 3, 8500 Nuernberg 70, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,018
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129051
Int. Cl.³ B63H *16/12*
U.S. Cl. 440—27 **3 Claims**

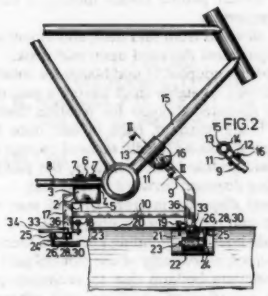


FIG.2

1. A bicycle watercraft comprising a conventional bicycle having a frame and said frame including an inclined bar extending upwardly and forwardly from the pedal hub of the frame and a rear wheel fork extending horizontally rearwardly of the pedal hub, a base framework rigidly holding and bodily supporting the frame of the bicycle, said base framework comprising a forward frame bar having a lower vertical portion and an upper rearwardly inclined portion which is substantially perpendicular to said inclined bar of the bicycle frame, a two-part clamp pivotally attached to said inclined portion near the top thereof and clampingly embracing said inclined bar of the bicycle frame, said base framework further comprising a rear angle bar having a horizontal portion and a vertical portion depending from the horizontal portion, a connecting horizontal longitudinal bar extending between the vertical portion of said forward frame bar and the vertical portion of the rear angle bar and being rigidly joined with each, said forward frame bar, rear angle bar and connecting horizontal longitudinal bar being disposed in a common vertical plane with the bicycle frame, said connecting horizontal longitudinal bar lying beneath said pedal hub, a second two-part clamp pivotally attached to the horizontal portion of the rear angle bar and

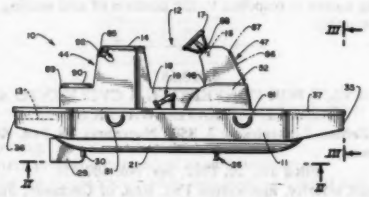
clampingly embracing said rear wheel fork of the bicycle frame, said first-named and second two-part clamps being pivotal on the base framework in said common vertical plane, horizontal transverse outrigger arms connected with the base framework and extending laterally outwardly from opposite sides thereof, a pair of laterally spaced floats secured to the outer end portions of the outrigger arms for buoyantly supporting the latter with said base framework and bicycle, and rider-operated propulsion and steering means for the bicycle watercraft including a propeller frictionally driven by the rear wheel of the bicycle.

4,493,658

PADDLE BOAT

Clifford F. Hildebrand, Peterson, Minn., assignor to Dean C. Hidebran, Sacramento, Calif.

Filed Dec. 16, 1982, Ser. No. 450,335
Int. Cl.³ B63H *16/12*
U.S. Cl. 440—30 **7 Claims**



1. In a foot pedal actuated paddle boat having a hull, a deck, a pair of longitudinal buoyant pontoons, one on each side of the bottom of the hull, a pair of spaced paddle blade housings in the hull having similar paddle blades therein, a rudder, the improvement comprising:

a driver's seat elevated from said deck and mounted upon a storage compartment disposed upon said deck,

a single set of pedals coupled to said blades for rotating same by a chain driven rotatable shaft having a pair of spaced hubs fixedly mounted thereon for rotation therewith in said paddle blade housings, each of said hubs having a plurality of paddle blades fixedly secured thereto rotatable in each of said paddle blade housings, the paddle blade housings being disposed forward of said seat,

a steering wheel disposed in front of said seat operably connected to said rudder for rotating same,

said paddle blade housings including apertures therethrough at the top thereof, rearwardly of the front of said boat for preventing vacuum buildup due to excessive pedalling followed by cessation of pedalling, and wherein each paddle blade is arcuate in the lateral cross-section, and wherein the radial orientation of said blades on one hub are non-synchronized with the radial orientation of the blades extending from the other hub whereby when one set of blades is in the water during operation of the boat, the other set of blades trail out of the water.

4,493,659

TILT-LOCK MECHANISM

Takashi Iwashita, Hamakita, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Dec. 2, 1981, Ser. No. 326,553
Claims priority, application Japan, Dec. 3, 1980, 55-171374
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—61 **11 Claims**

1. In a marine vessel having a hull and an outboard drive unit carrying propelling means for propelling said vessel through the water pivotably attached thereto for movement about a generally horizontally extending tilt axis from a normal position wherein the propelling means is positioned beneath the water and a tilted up position wherein said propelling means is out of the water, a mechanism for damping the relative pivotal movement between said drive unit and said vessel about said tilt axis, said mechanism defining at least two fluid chambers and having restricted communication means for restrictively passing fluid between said chambers for damping the relative

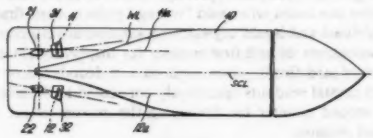
pivotal movement of said drive unit and said vessel, the improvement comprising fluid bypass means for selectively overriding said restricted communication means, thereby allowing free relative pivotal movement of said drive unit and said vessel about said tilt axis.

4,493,660

SHIP HAVING AT LEAST ONE PROPELLER NOZZLE UNIT WITH RUDDER IN OPTIMUM POSITION

Willi Becker, and Karl Johannsen, both of Hamburg, Fed. Rep. of Germany, assignors to Willi Becker Ingenieurbüro GmbH, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 18,313, Mar. 7, 1979, abandoned. This application Jun. 22, 1981, Ser. No. 275,607
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1978, 2809662
Int. Cl.³ B63H *1/28*
U.S. Cl. 440—67 **13 Claims**



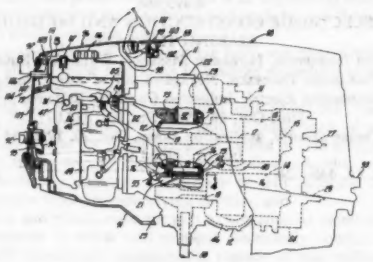
1. Propulsion assembly for use on a ship having an elongated ship's body, said assembly comprising two propellers arranged to be mounted on the ship's body in laterally spaced relation and including an axially elongated propeller shaft for each said propeller having a front end and a rear end with said propeller located at the rear end thereof, said propeller shaft having an axis extending approximately horizontally, a nozzle-type shroud laterally enclosing each said propeller and having an axis extending in the same general direction as the axis of the associated said propeller shaft, means for mounting each said shroud for rotation about an upwardly extending first axis disposed approximately perpendicularly to the axis of the associated said propeller shaft, wherein the improvement comprises that said means for mounting said shroud is arranged for rotating said nozzle-type shroud for limited pivotal movement about a second axis extending perpendicularly of the upwardly extending first axis of said nozzle-type shroud and approximately perpendicularly to the axis of said propeller shaft, a rudder located downstream from each of said nozzle-type shrouds relative to the normal forward movement of a ship's body in the wake of the associated said propeller, said rudder has a zero position, said rudder having an upwarldy extending pivot axis offset laterally from the prolongation of the associated said propeller shaft, and in the zero position said rudder being disposed at least at the same angle with the prolongation

of said propeller shaft as said nozzle-type shroud is pivoted relative thereto, and each said nozzle-type shroud having an angular adjustment relative to the elongated approximiately horizontal axis of the associate said propeller shaft of at least two degrees, said means for mounting each said shroud comprises an upwardly extending shaft for each said shroud, a ball-type joint connected to the lower end of said shaft and to said shroud, said upwardly extending shaft arranged to extend into the ship's body, means arranged to be located within the ship's body for rotating said shaft about the axis thereof, means connected to said ball-type joint for rotating said joint about a horizontal axis for pivoting said shroud about a horizontal axis extending perpendicularly of the axis of said shaft, and means arranged for locking said shroud in position for achieving a maximum of the integral of the velocity field established across the entry area in the direction of the nozzle axis, and said locking means is associated with said shaft locking said shaft against rotation about the axis thereof and for locking said shroud against pivotal movement around the horizontal axis extending perpendicualrly of the axis of said shaft.

4,493,661
OUTBOARD ENGINE

Tomio Iwai, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 281,418, Jul. 8, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 528,996
Claims priority, application Japan, Jul. 12, 1980, 55-95282
Int. Cl.[3] B63H *21/26*
U.S. Cl. 440—77 **20 Claims**



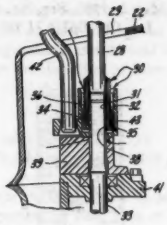
1. In a lubricating system for a two-cycle, crankcase compression internal combustion engine having a cylinder block, a cylinder head affixed to said cylinder block, a crankshaft supported for rotation within a crankcase affixed to said cylinder block about a vertically extending axis by at least vertically spaced upper bearing means and lower bearing means, the improvement comprising an oil supply tank mounted externally of said cylinder head, cylinder block and crankcase, oil pump means supported externally of said cylinder head, cylinder block and crankcase and driven directly by said crankshaft, means for delivering oil from said external oil supply tank to said oil pump means and conduit means extending from said oil pump means to at least said upper bearing means for positively lubricating said upper bearing means.

4,493,662
SHAFT CONNECTING DEVICE FOR BOAT PROPELLERS

Michihiro Taguchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 28, 1982, Ser. No. 373,026
Int. Cl.[3] B63H *21/28*
U.S. Cl. 440—83 **5 Claims**

1. In a transmission control shaft connection for the outboard drive of a marine engine or the like comprising a first shaft, a second shaft and a coupling member affixed to said first shaft and operatively connected to said second shaft for disconnectably coupling said shafts together, the improvement comprising a seal member affixed to and carried by, and rotatable with said coupling member, sealingly engaged with said

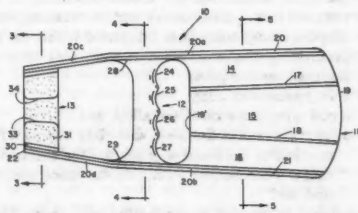


second shaft and enclosing the operative connection between said shafts for protecting the operative connection from the ingress of foreign matter, said second shaft, said coupling member and said member being axially movable relative to said first shaft for removal for service.

4,493,663
ONE-HANDED PADDLE

Raymond W. Richmond, P.O. Box 187, Con Can, Tex. 78838

Filed Jan. 10, 1983, Ser. No. 456,552
Int. Cl.[3] B63H *16/04*
U.S. Cl. 440—101 **3 Claims**



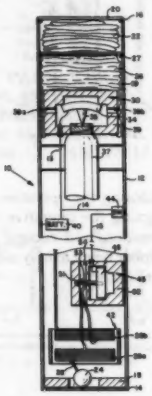
1. A one-handed paddle comprising:
a blade portion, a hand grip portion and a arm brace portion;
said arm brace portion including rearwardly extending flexible arm members at each side thereof which are connected with the hand grip portion and blade portion;
said arm members flexing to allow insertion of a user's arm in the arm brace portion;
the arm brace portion including a generally U-shaped member lined with a resilient member made of a resilient cushioning material which releasably retains and cushions a user's arm in the arm brace portion; and
said resilient cushioning material including arm retaining extension members forming an opening for the arm retaining portion smaller than a user's arm for releasably securing a user's arm in the arm brace portion.

4,493,664

SONOBUOY FLOAT INFLATION AND DEPTH SELECTION INITIATORS

John R. Dale, Pennsburg, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1982, Ser. No. 373,943
Int. Cl.³ B63B *21/00*
U.S. Cl. 441—7 **2 Claims**



1. A buoy comprising in combination:
a casing;
deployable means releasably stored within said casing, said deployable means comprises an inflatable float;
shape-memory means, transformable to a predetermined shape by heating, mounted within said casing and operatively connected to release said deployable means adjacent thereto for deployment thereof when transformed, said shape-memory means comprises actuator means mounted within said casing, connected to the float, and having a cavity, an input port leading into the cavity, and two output ports communicating between the cavity and the float, pressurized gas means connected to the input port and having a rupturable seal for retaining the gas, and shape-memory lance means disposed within the cavity for penetrating the seal when heated, said shape-memory lance means comprises
a shape-memory alloy,
a coil wrapped around the alloy, and
a lance secured to the alloy, said alloy having a first shape positioning the lance to penetrate the seal and a second shape when heated such that the lance penetrates the seal; and
condition responsive means within said casing for heating and transforming said shape-memory means, said condition responsive means comprises energizing means electrically connected to the shape-memory lance means for heating the shape-memory alloy.

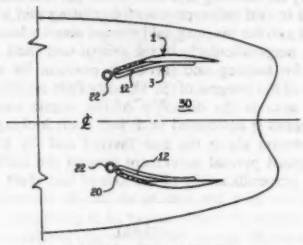
4,493,665

HYDROFOIL

Edward M. Liddle, 9784 Rim Park Way, San Diego, Calif. 92124

Filed Jun. 7, 1982, Ser. No. 385,303
Int. Cl.³ A63C *15/05*
U.S. Cl. 441—79 **13 Claims**

1. A hydrofoil comprising:
(a) a fin means,
(b) an elongated fin flange affixed to a base of the fin means,
(c) a fin box means defining an elongated, laterally curved open channel" adapted to receive the fin flange at a plurality of locations along the length of the open channel, the fin box being affixed to a hull,
(d) a longitudinal groove defined by the fin flange,
(e) a longitudinal groove defined by a wall of the open channel and adapted to align with the fin flange groove when the fin flange is disposed in the open channel such that the two grooves in alignment form a generally closed channel,



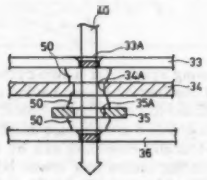
(f) a fastening rod adapted to be inserted into the closed channel for the purpose of holding the two grooves in alignment and thereby inhibiting transversal movement of the fin flange with respect to the fin box, and
(g) means to inhibit longitudinal movement of the fin flange with respect to the fin box.

4,493,666

ELECTRODE CONSTRUCTION AND METHOD OF MAKING THE SAME

Kinzo Nonomura, Hirakata; Masanori Watanabe, Katano, and Yoshinobu Takesako, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 16, 1981, Ser. No. 312,077
Claims priority, application Japan, Oct. 20, 1980, 55-147221
Int. Cl.³ H01J *9/14*
U.S. Cl. 445—24 **1 Claim**



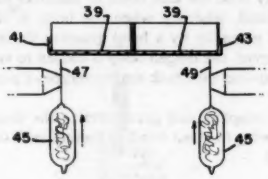
1. A method for making an electrode construction for a flat-type display device comprising the steps of:
photolithographically forming a composite electrode comprising numerous strip electrodes each connected to the other by connecting means substantially adjacent each end of said strip electrodes and at least one intermediate position;
bonding said composite electrode to another electrode of higher rigidity so that they are in stacked relationship with each other; and
cutting out said connecting means by means of a high energy beam, wherein each said connecting means corresponding to said at least one intermediate position is located over aperature means in said another electrode to allow the passing through of said high energy beam during the cutting, and thereby obtaining electrically isolated but mechanically rigidly held parallel strip electrode members.

4,493,667

MULTILAMP PHOTOFLASH ARRAY FABRICATION

Donald E. Armstrong, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 18, 1982, Ser. No. 359,467
Int. Cl.³ H01J 9/00
U.S. Cl. 445—28 8 Claims



1. A process for fabricating a multilamp photoflash array having a support member with a printed circuit on the inner surface thereof and a plastic reflector unit having one surface with a plurality of lamp-receiving cavities comprising the steps of:

positioning a photoflash lamp having a pair of outwardly extending electrically conductive leads on the side of said reflector unit opposite from each of said lamp-receiving cavities with said electrically conductive leads adjacent said reflector unit;

heating said electrically conductive leads to a temperature sufficient to melt said plastic reflector unit;

contacting said plastic reflector unit with said heated electrically conductive leads to cause said leads to pass through said plastic reflector unit;

cooling said electrically conductive leads and plastic reflector unit to cause said leads to become embedded in said plastic reflector unit;

bending said electrically conductive leads about the closest end of said plastic reflector unit to cause each of said lamps to nest within one of said cavities of said reflector unit and to provide exposed electrically conductive leads immediately adjacent the surface of said reflector unit opposite from lamp-receiving cavities; and

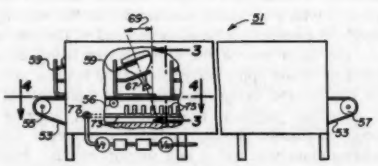
affixing said plastic reflector unit to said support member in a manner to cause said exposed electrically conductive leads immediately adjacent the surface of said reflector unit opposite from said lamp-receiving cavities to electrically contact said printed circuit.

4,493,668

METHOD FOR COMBINED BAKING-OUT AND PANEL-SEALING OF A PARTIALLY-ASSEMBLED CRT

Joseph J. Piasecinski, Leola; Randolph H. Axelrod, and James Mount, both of Lancaster, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,653
Int. Cl.³ C03B 23/20
U.S. Cl. 445—40 8 Claims



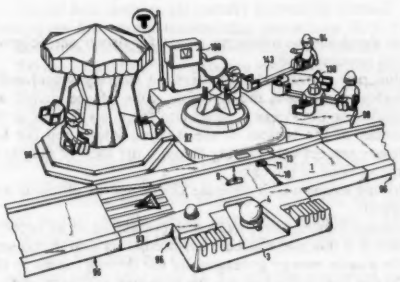
1. In a method for fabricating a cathode-ray tube including heat-sealing a glass faceplate panel to a glass funnel, said funnel having an open, relatively-narrow neck attached to the narrow end thereof, and, at the same time, baking-out substantial amounts of organic matter from coatings on surfaces inside said panel and said funnel, said heat-sealing and baking-out being conducted at elevated temperatures in a substantially-quiescent atmosphere, said method including a heating-up period and a cooling-down period, the improvement comprising intermittently directing jets of oxygen-containing gas into the neck of said funnel at least during the heating-up period, and wherein the longitudinal axis of said neck is at an acute angle with respect to the direction of flow of said jets.

4,493,669

MOTORIZED TOY

Hermann Neuhierl, Waldstrasse 36, D-8510 Fürth/Bayern, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 366,982
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114838; May 30, 1981, 3121564; May 30, 1981, 3121568; Aug. 17, 1981, 3132299; Sep. 18, 1981, 3137208; Dec. 19, 1981, 3150466; Dec. 24, 1981, 3151459; Feb. 3, 1982, 3203627; Feb. 3, 1982, 3203574; Mar. 9, 1982, 3208338
Int. Cl.³ A63H 18/00
U.S. Cl. 446—103 59 Claims



1. A motorised toy comprising: at least one toy self-propelled vehicle having a pin mounted thereon which pin projects from the vehicle, said vehicle including driving means which acts on at least one pair of supporting wheels mounted on said vehicle; at least one station section including a track portion which can be installed in the course of a track, said station section having a stopping arrangement mounted thereon including a start member and lever means for moving said start member between at least two positions and whereby it can be brought into operative connection with the pin on the vehicle, causing the vehicle to stop in a defined position in the station section said station section having mounted thereon an axle arranged at right angles to the track portion and underneath the latter, with at least one rotary component which projects upwardly out of the track portion and which can be rotated by one of said driven wheels when the toy vehicle stops in the defined position, there being an engagement component at one end of the axle; and at least one toy object which has movable parts and which can be connected with said station section in a fixed but detachable manner so that, by way of an engagement component thereof, it is in contact with the engagement component of the station section whereby the movable parts can be moved via the engagement components when said toy vehicle has stopped in the station section in the defined position, wherein: the vehicle has a lever which can be moved between at least a forward and a reverse travel position and which acts accordingly on the vehicle's driving means; said start member having a slot corresponding to the dimensions of the pin on the vehicle extending transversely of the track portion, into which slot the pin of the vehicle engages in at least one of the positions of the start member in order to stop the vehicle, irrespective of the vehicle's travel direction, in the

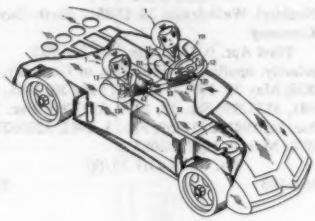
defined position, and wherein in at least one other position of the lever of the stopping arrangement, the pin on the vehicle and the slot in the start member are disengaged.

4,493,670

SIMULTANEOUS FOLLOWING MEANS FOR DRIVER AND FOLLOWER IN A TOY CAR

Ta-Lung Wang, 1st Fl., No. 27, Lane 432, Wu-Hsing St., Taipei, Taiwan

Filed Dec. 21, 1983, Ser. No. 563,697
Int. Cl.³ A63H *17/25*
U.S. Cl. 446—288 2 Claims



1. A simultaneous following means for driver and follower in a toy car comprising:

a doll pair comprised of a driver, a steering wheel and a follower wherein the movable arms of the driver are placed on the steering wheel and there is a spindle at the center of the bottom of the steering wheel and the follower respectively passing through the shell of the car to the interior of the car;

a driving means which generate kinetic energy output at low speed;

a linkage transmission mechanism comprised of an eccentic wheel, a link and a double bar-oscillating arm to transmit the kinetic energy generated by the driving means to the double bar-oscillating arm for swinging said arm; and

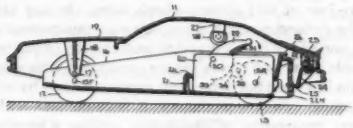
a following mechanism which upon the swinging of the said double bar-oscillating arm, drive the spindles of the steering wheel and the follower for rotation in normal or reverse direction at a small degree to cause the steering wheel and follower for simultaneous swinging.

4,493,671

TOY VEHICLE HAVING SPRING-OPERATED MOTOR

Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Avi Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Filed May 6, 1981, Ser. No. 260,588
Int. Cl.³ A63H *29/00*
U.S. Cl. 446—464 10 Claims



1. A toy vehicle whose spring-operated motor requires little strength to fully charge, said vehicle comprising:

A. a chassis supporting front and rear wheels;

B. a car body resting on the chassis, the front of the body being hingedly connected on a pivot axis to the front end of the chassis whereby the rear thereof is raisable with respect to the rear end of the chassis within predetermined upper and lower limits, said body having a stop attached thereto having fingers which engage a ledge projecting from the rear wall of the chassis to define said upper limit;

C. a spring-operated motor seated on the chassis and concealed by the body, said motor having a spiral spring coupled by a transmission to said rear wheels;

D. a pivotally-mounted crank arm operatively coupled to the underside of the roof of the car body at a point intermediate the front and rear wheels and spring-biased to normally hold the arm erect to maintain the body at its upper limit, whereby when the body is repeatedly depressed manually by a hand grasping the body near the rear thereof, the hinged body is caused to swing about its pivot axis and the crank arm undergoes a pumping action; and

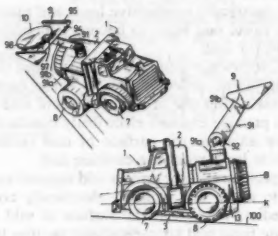
E. means coupling said crank arm to the inner end of the spiral spring to effect winding thereof each time the arm is pumped.

4,493,672

TOY VEHICLE ASSEMBLY

Masumi Terui, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,821
Claims priority, application Japan, Dec. 29, 1982, 57-201733
Int. Cl.³ A63H *29/00*
U.S. Cl. 446—464 19 Claims



1. A toy vehicle assembly adapted to receive a removable weighted member comprising:

a housing member having a configuration which simulates a vehicle, including an upper body shell and a lower frame member;

a front wheel assembly attached to said housing member;

a rear wheel assembly including an axle and a pair of wheels attached to said housing member, and

a support member for supporting said weighted member attached to the rear wheel assembly side of said housing member, wherein said support member includes an arm member with a weighted member holder for holding said weighted member provided at one end of the arm member, the other end of the arm member being movably attached to said upper body shell of the housing member, the arm member being rotatable about a plurality of axes in directions different from each other, wherein said weighted member holder includes a weighted member holding plate attached to said support member having a first bracket and a pair of retaining projections provided on a first surface of the holding plate, whereby said weighted member can be removably supported on the first surface of said holding plate by the holding plate, the first bracket, and the pair of retaining projections.

4,493,673

TORSIONAL VIBRATION DAMPER UNIT

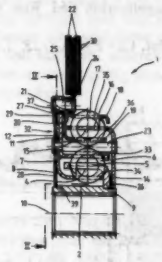
Peter Anders, Schweinfurt, and Bernhard Schierling, Unterpleichfeld, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,522

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142842

Int. Cl.³ F16D *3/14, 13/64;* F16F *15/12*

U.S. Cl. 464—66 21 Claims



1. In a torsional vibration damper unit, such as for clutch discs comprising

(a) a torque output member (2) having an axis of rotation (10);

(b) a torque input member (30) mounted for angular movement with respect to said torque output member (2) about said axis of rotation (10);

(c) a torque output transmission unit (4, 9) fixed to said torque output member (2) for common rotation therewith about said axis of rotation (10);

(d) a torque input transmission unit (18, 21; 19, 20) fixed to said torque input member (30) for common rotation therewith about said axis of rotation (10);

(e) an intermediate torque transmission unit (17, 11; 8, 12; 15, 14) mounted for angular movement about said axis of rotation (10) with respect to said torque output transmission unit (4, 9) and said torque input transmission unit (18, 21; 19, 20);

(f) at least one first torque transmitting spring unit (6) in torque transmitting arrangement between said torque output transmission unit (4, 9) and said intermediate torque transmission unit (7, 11; 8, 12; 15, 14), said first torque transmitting spring unit (6) having a working line substantially tangential with respect to said axis of rotation (10);

(g) at least one second torque transmitting spring unit (17) in torque transmitting arrangement between said intermediate torque transmission unit (7, 11; 8, 12; 15, 14) and said torque input transmission unit (18, 21; 19, 20), said second torque transmitting spring unit (17) having a working line substantially tangential with respect to said axis of rotation (10)

the improvement comprising:

said first torque transmitting spring unit (6) and said second torque transmitting spring unit (17) are received in three respective radially aligned openings (5, 33, 34; 16, 35, 36) of a plurality of torque transmitting sleeve units (4, 7, 8; 15, 18, 19), at least one (4) of said torque transmitting sleeve units being a part of said torque output transmission unit (4, 9), at least one (18, 19) of said torque transmitting sleeve units being a part of said torque input transmission unit (18, 21; 19, 20) and at least one (15, 7, 8) of said torque transmitting sleeve units being a part of said intermediate torque transmission unit (7, 11; 8, 12; 15, 14), said first torque transmitting spring unit (6) is received by radially aligned openings (5, 33, 34) of three first torque transmitting sleeve units (4, 7, 8) surrounding said axis of rotation (10), namely a first middle sleeve unit (4) and two first side sleeve units (7, 8), said first side sleeve units (7, 8) being arranged radially outwardly and radially inwardly of said first middle sleeve unit (4), respectively, said first middle sleeve unit (4) being a part of one of said torque output transmission unit (4, 9) and said intermediate torque transmission unit (7, 11; 8, 12; 15, 14), said two first side sleeve units (7, 8) being parts of the other of said torque output transmission unit (4, 9) and said intermediate torque transmission unit (7, 11; 8, 12; 15, 14); said second torque transmitting spring unit (17) is received by radially aligned openings (16, 35, 26) of three second torque transmitting sleeve units (15, 18, 19) surrounding said axis of rotation (10), namely a second middle sleeve unit (15) and two second side sleeve units (18, 19), said second side sleeve units (18, 19) being arranged radially outwardly and radially inwardly of said second middle sleeve unit (15), respectively, said second middle sleeve unit (15) being a part of one of said torque input transmission unit (18, 21; 19, 20) and said intermediate torque transmission unit (7, 11; 8, 12; 15, 14), said two second side sleeve units (18, 19) being parts of the other of said torque input transmission unit (18, 21; 19, 20) and said intermediate torque transmission unit (7, 11; 8, 12; 15, 14);

said torque output member (2) is a central hub member (2) and said torque input member (30) is surrounding said central hub member (2) radially outwardly thereof,

said three first torque transmitting sleeve units (4, 7, 8) and said three second torque transmitting sleeve units (15, 18, 19) are located radially between said central hub member (2) and said torque input member (30), said three second torque transmitting sleeve units (15, 18, 19) being located radially outwardly of said three first torque transmitting sleeve units (4, 7, 8),

said first middle sleeve unit (4) comprises a radially inwardly directed flange (9) fixed to said hub member (2) for common rotation therewith adjacent a first axial end thereof;

said second middle sleeve unit (15) comprises a radially inwardly directed flange (14) adjacent said first axial end of said hub member (2);

said first side sleeve units (7, 8) comprise respective radially outwardly directed flanges (11, 12) adjacent the second axial end of said hub member (2);

the radially outwardly directed flanges (11, 12) of said first side sleeve units (7, 8) are interconnected with said radially inwardly directed flange (14) of said second middle sleeve unit (15) by substantially axially extending interconnecting members (23);

said second side sleeve units (18, 19) comprise respective radially outwardly directed flanges (21, 20) fixed to said torque input member (30) which are axially adjacent said second end of said hub member (2);

said first middle sleeve unit (4) with its radially inwardly directed flange (9) defining said torque output transmission unit (4, 9);

said first side sleeve units (7, 8) with their radially outwardly directed flanges (11, 12) and said second middle sleeve unit (15) with its radially inwardly directed flange (14) defining said intermediate torque transmission unit (7, 11; 8, 12; 15, 14);

said second side sleeve units (18, 19) with their radially outwardly directed flanges (21, 20) defining said torque input transmission unit (18, 21; 19, 20).

4,493,674

VIBRATION DAMPER ASSEMBLY

Kazuhisa Tamura, Hirakata, and Masahiko Koshimo, Higashi-Osaka, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Sep. 22, 1982, Ser. No. 421,338

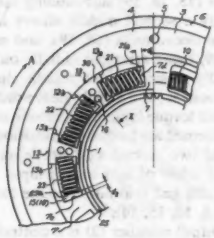
Claims priority, application Japan, Jan. 27, 1982, 57-10387[U]

Int. Cl.³ F16D *3/14*

U.S. Cl. 464—68 5 Claims

1. A vibration damper assembly comprising an output hub

having circumferentially spaced plural radial arms and arcuate openings between the arms; input covers disposed at both sides of the hub and having openings axially faced to the openings in the hub defining sets of openings; plural torsion springs arranged circumferentially tandem in each set of the openings in the hub and the covers; and floating spacers arranged between the torsion springs and circumferentially slidably supported by rail portions formed by radially outer and inner edges of the openings in the hub, each said spacer having portions overlapping said inner and outer edges;



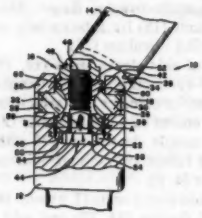
each of the floating spacers comprising a middle slider which is slidable and in contact with the rail portions forming radially outer and inner edges of the opening in the hub, and a pair of end plates fixed by a rivet to both face surfaces of the middle slider, said overlapping portions of each spacer being formed by portions of each end plate slidably holding the rail portions from both sides thereof.

4,493,675

UNIVERSAL JOINT

Scott D. Wisthuff, South Bend, Ind., and Edgar A. Behrmann, Niles, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 22, 1983, Ser. No. 487,556
Int. Cl.³ F16D *3/24*
U.S. Cl. 464—136 **2 Claims**



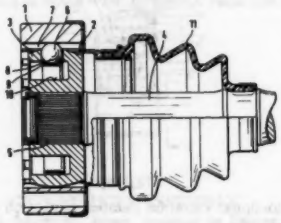
1. A universal joint comprising a first member and a second member rotatable together about their individual axes which are angularly disposed with respect to each other, each of the members carrying a pair of ball studs, a pair of washer-like seats engageable with the ball studs and a nut and bolt assembly cooperating with the pair of washer-like seats to retain the latter in engagement with the ball studs, characterized in that said nut and bolt assembly cooperates with one of said pair of washer-like seats to define a nonrotatable interface and said one washer-like seat is disposed in opposition to said first member to prevent rotation of said one washer-like seat when the nut and bolt assembly are being assembled to engage the pair of washer-like seats with the ball studs, said one washer-like seat cooperating with at least one of said ball studs during assembly to permit said pair of washer-like seats to fully engage said ball studs in the absence of a holding tool preventing rotation of said nut and bolt assembly, said first member defines a cavity receiving said nut and bolt assembly, and said bolt includes a head engageable with a bottom wall of said cavity when said one washer-like seat is engaging said head and in opposition with said one ball stud.

4,493,676

ROTARY CONSTANT VELOCITY JOINT

Werner Krude, Seigburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft

Filed Feb. 17, 1983, Ser. No. 467,212
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206437
Int. Cl.³ F16D *3/22, 3/84*
U.S. Cl. 464—141 **9 Claims**



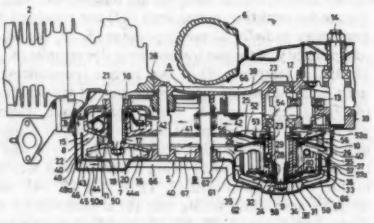
1. A rotary constant velocity universal joint, comprising:
an outer joint member and an inner joint member arranged on the interior of said outer joint member;
radially extending recesses formed in one of said inner and outer joint members;
torque transmitting balls arranged within said radially extending recesses so as to be radially movable therein;
grooves formed in the other of said joint members adapted to have said torque transmitting balls engaged therein for effecting torque transmission between said inner and outer joint members; and
an annular resilient member arranged in engagement with said balls and structured to apply thereto a radially directed biasing spring force urging said balls within said recesses into torque transmitting engagement with said grooves.

4,493,677

BELT TRANSMISSION HAVING CIRCULATED AIR COOLING FUNCTION

Yasuo Ikenoya, Kawagoe, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,455
Claims priority, application Japan, Dec. 29, 1981, 56-194809[U]; Dec. 29, 1981, 56-194812[U]; Dec. 29, 1981, 56-194813[U]; Feb. 25, 1982, 57-29329; Mar. 1, 1982, 57-28618[U]
Int. Cl.³ F16H *57/04*
U.S. Cl. 474—93 **17 Claims**



1. A belt transmission comprising: a drive pulley; a driven

pulley; a belt engaging with said drive pulley and said driven pulley; a casing accommodating said drive pulley, said driven pulley and said belt; fan means provided on at least one of said drive pulley and said driven pulley for rotation in unison therewith; means partitioning the interior of said casing into a first chamber and a second chamber, said first and second chambers extending at least between said drive pulley and said driven pulley; and means communicating said first chamber and said second chamber with each other; said fan means, said partitioning means and said communication means being arranged such that rotation of said fan means causes a gas in said casing to be circulated in said casing through said first and second chambers to effect heat exchange with said drive pulley, said driven pulley, said fan means and said belt, whereby one of said first and said second chamber serves as going passage, and the other as a return passage, respectively.

4,493,678

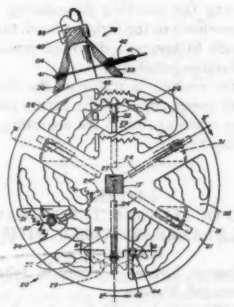
EXPANDIBLE SPROCKET

Royce H. Husted, Wheaton, Ill., assignor to Samuel Shiber, Mundelein, Ill.

Continuation-in-part of Ser. No. 310,506, Oct. 13, 1981, abandoned. This application Jun. 11, 1982, Ser. No. 387,618

Int. Cl.³ F16H *55/30, 55/54*

U.S. Cl. 474—164 **8 Claims**



1. A variable sprocket comprising in combination:

an axle,

a drive flange mounted on said axle,

an indexing flange rotatably mounted on said axle opposite of said drive flange and having a plurality of spiral-wavy-cams,

two sprocket-segment-planets, said sprocket-segment-planet having leading teeth which provide initial contact with a chain and additional chain engaging teeth for subsequent engagement with said chain, at least a portion of said leading teeth is removed such that their profile is reduced relative to the profile of said chain engaging teeth,

at least two idler-planets sandwiched between said flanges,

coupling means for transmitting tangential forces between said spiral-wavy-cams and said drive flange,

cam follower attached to said planets for engaging with and following said spiral-wavy-cams,

said spiral-wavy-cams comprising a series of alternating depressions and hills which move the planets closer and further to and from said axle, respectively, as said planets slides along said spiral-wavy-cams,

said chain made of links and having a pitch equalling the length of said chain divided by the number of said links, said chain wrapping approximately one half of the periphery of said variable-sprocket, tension in said chain generating tangential loads on said sprocket-segment-planets which are transmitted through said coupling means to said drive flange, tension in said chain also generating radial loads on said planets which are transmitted by said cam follower to said spiral-wavy-cams forcing and securing the cam follower in said depression, the location of said planets when their cam follower are seated in said depressions and when both sprocket-segment-planets are engaged with said chain is such that the length of chain which is trapped between said sprocket-segment-planets is a whole number of pitches.

4,493,679

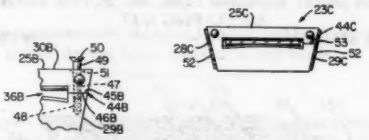
BELT CONSTRUCTION, TRANSVERSE BELT ELEMENT THEREFOR AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Oct. 25, 1982, Ser. No. 436,745

Int. Cl.³ F16G *5/00*

U.S. Cl. 474—201 **10 Claims**



1. In an endless power transmission belt construction comprising an endless flexible carrier means, and a plurality of transverse belt elements assembled on said carrier means, each said belt element having peripheral face means and a medial slot means passing therethrough and receiving part of said carrier means therein, each said belt element having a slit means in said peripheral face means thereof that leads to said slot means thereof and a hinge means spaced from said slit means that permits said belt element to have said slit means thereof opened sufficiently to permit at least part of said carrier means to be received therethrough for subsequent positioning in said slot means thereof and thereafter be moved to a closed position to prevent at least that part of said carrier means from escaping through said slit means, each said belt element having two adjacent surfaces defining said slit means thereof therebetween, the improvement wherein each belt element has fastening means securing said adjacent surfaces thereof against each other so that said slit means thereof is maintained in said closed position thereof.

4,493,680

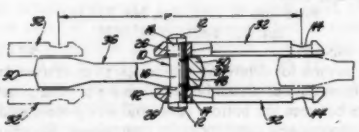
WEAR COMPENSATING LINK PIN

Frank F. Hoffmann, St. Clair, Mich., assignor to Florkey's Conveyor Service, Inc., Warren, Mich.

Filed Dec. 2, 1982, Ser. No. 446,429

Int. Cl.³ F16G *13/07*

U.S. Cl. 474—230 **6 Claims**



1. A link pin for connecting a pair of side links to a center link disposed therebetween, said link pin comprising:

retaining means at each end thereof for retaining said link pin within the side and center links; and

a shaft portion disposed between said retaining means and including a pair of end portions and a central portion therebetween and a central axis extending therethrough and first and second offset axes being parallel to said central axis and disposed on each side thereof, said shaft portion including a central protrusion extending from said

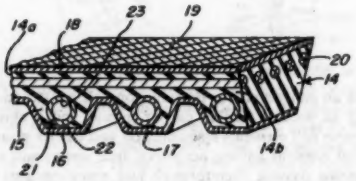
central portion and radially outwardly from said first offset axis and said end portions, said central protrusion having an outer arcuate surface defining an arc circumscribed about said first offset axis and a lateral protrusion extending from each of said end portions and radially outwardly from said second offset axis and said central portion in a direction opposite to said central protrusion, each of said lateral protrusions having an outer surface defining an arc circumscribed about said second offset axis.

4,493,681

REINFORCED COG BELT

Hiroshi Takano, Miki, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Sep. 29, 1982, Ser. No. 428,418
Claims priority, application Japan, Jan. 26, 1982, 57-9299[U]
Int. Cl.³ F16G *5/10*
U.S. Cl. 474—265 **19 Claims**



1. A V-section cog belt comprising:
an elongated V-section rubber body having longitudinally spaced, inner cogs defining an inner surface and side edges;
tensile cords extending longitudinally of the belt outwardly of said cogs;
tubular rigid metal reinforcement members extending transversely across the belt in said cogs in outwardly spaced relationship to said inner surface thereof, said members being hollow and opening to said side edges for passing cooling air therethrough during driving operation of the belt; and
a fabric layer covering said inner surface of the rubber body inwardly of said reinforcement members.

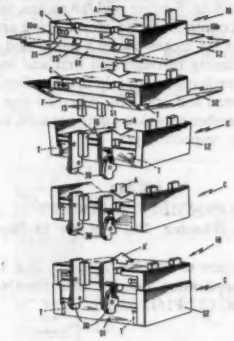
4,493,682

APPARATUS AND METHOD FOR FORMING AND DEBOWING CARTONS WITH PINCHING WHEELS

John W. Bryson, Los Altos, and William H. Hittenberger, San Mateo, both of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Jan. 5, 1982, Ser. No. 337,167
Int. Cl.³ B31B *1/50, 3/26*
U.S. Cl. 493—174 **17 Claims**

14. A method for debowing side panels of an erected carton formed from flat cut carton blanks having a bottom panel and fold lines between the bottom panel and side panels, said side panels including side panel locks for maintaining the cartons in the erect condition, said carton blanks being formed on an apparatus including pinching wheels and a forming head for receiving and directing the carton blank with reciprocating moving means through a die having forming guides, comprising the steps of:
(a) erecting the carton blank to a partially erected position by moving the forming head in a descending forming stroke in response to reciprocating means,
(b) passing the partially erected carton through the side forming guides so as to allow the carton side panels to engage the forming guides and bend upwardly into upright position relative to the bottom panel, said side panels thereby engaging side walls of the forming head;
(c) pinching the erected carton side panels inwardly from the fold lines into cutout openings formed in the forming head side walls with pinching wheels, thereby capturing and creasing the fold lines in pinching engagement and overbreaking the side panels;



(d) discontinuing the pinching step during continued descending movement of the forming head, thereby enabling the side panels to assume a debowed position relative to the carton bottom panel; and
(e) stripping the erected carton from the forming head by engaging the upper edges of the carton side panels with the pinching wheels prior to the ascending return stroke of the forming head.

4,493,683

METHOD OF MANUFACTURING BAG-LIKE PACKAGING BLANKS PROVIDED WITH CLOSURE RIBBONS

Jan Jostler, Halmstad, Sweden, assignor to Joker System Aktiebolaget, Halmstad, Sweden

PCT No. PCT/SE82/00014, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982, PCT Pub. No. WO82/02514, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 18, 1982, Ser. No. 425,073
Claims priority, application Sweden, Jan. 20, 1981, 8100289
Int. Cl.³ B65D *33/28*
U.S. Cl. 493—225 **11 Claims**

1. A method of manufacturing bag-like packaging blanks of flexible material provided with respective closure ribbons, said method comprising feeding a belt of packaging blanks arranged one after the other and capable of being separated from each other, engaging the belt with guide devices to open the packaging blanks by moving opposing side walls of the blank belt away from one another at the upper edges of the belt, each of the walls of the belt having, in the vicinity of the upper edge of the packaging blanks, at least one channel extending in the longitudinal direction of the blank belt, in which channel is

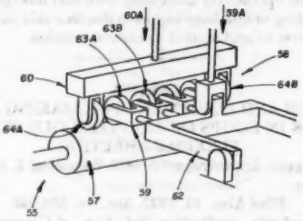
arranged at least one closure ribbon which has been shortened in length, the blank belt being further provided with opposed strip-like areas in the vicinity of the upper edges, which join the packaging blanks together and provide suspension regions adapted to be engaged by the guide devices for guiding the blanks thereon, to open the blanks as the belt advances while concurrently increasing the distance between two adjacent packaging blanks so that parts of the closure ribbons are drawn out of the channels in the packaging blanks and are exposed between adjacent blanks joining the thus exposed closure ribbons between the adjacent blanks and cutting the now joined ribbons to form endless closure ribbons in each packaging blank.

4,493,684

METHOD FOR MAKING PARTIALLY SEPARATED MULTIBAGS

Roderick A. Bolton, Clarkson, Canada, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Jul. 7, 1983, Ser. No. 511,696
Claims priority, application Canada, Oct. 4, 1982, 412722
Int. Cl.³ B65B *43/04*
U.S. Cl. 493—234 **9 Claims**



1. A method for making a supply of partially separated multibag units, comprising:

(a) passing a perforated chain of side-sealed bags through a first set of driven nip rollers; then

(b) passing said chain directly to a second set of nip rollers, having a partial nip of selected width less than the width of said chain; while

(c) driving said second nip rollers at a speed greater than said first nip rollers sufficient to partially separate the bags at their respective lines of perforation; and while

(d) cyclically completing the nip of said second nip rollers at predetermined intervals corresponding to the number of bags desired in each multibag unit.

4,493,685

METHOD OF MAKING TUBULAR BAG

Robert H. Blamer, Westmont, Ill., assignor to Bagcraft Corporation of America, Chicago, Ill.

Division of Ser. No. 242,267, Mar. 10, 1981, Pat. No. 4,461,031.
This application Sep. 15, 1982, Ser. No. 418,549
Int. Cl.³ B31B *23/60*
U.S. Cl. 493—235 **5 Claims**

1. A method of making a tubular bag, comprising:

(a) on one side of a web, printing a first band of thermosetting glue transversely to the length of the web;

(b) on the opposite side of the web, printing a second band and a third band of thermosetting glue in registry with the ends of said first band;

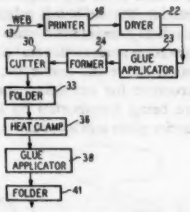
(c) drying said printed glue with heat at a temperature below that of the softening temperature of said thermosetting glue;

(d) applying glue to a marginal edge of said web;

(e) forming said web as a tube with the marginal edges of the web overlapping and glued together as a back seam;

(f) severing an increment of said tube at said bands without heating said bands,

(g) folding said web along a line extending centrally through said glue bands; and



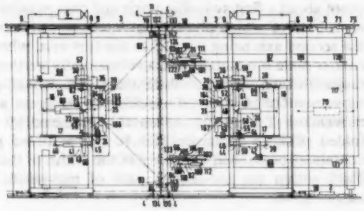
(h) simultaneously clamping together and heating said bands to fuse the bag layers together at said bands.

4,493,686

APPARATUS FOR PULLING TUBE ENDS OPEN TO FORM BASE SQUARES OF CROSS-BOTTOM SACKS

Ulrich Eckelt, Tecklenburg, and Alois Winnemöller, Rheine, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,655
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143772
Int. Cl.³ B31B *1/52*
U.S. Cl. 493—256 **16 Claims**



1. Apparatus for pulling tube ends open to form base squares in the production of large cross-bottom sacks, comprising table plates which are disposed in the machine frame parallel to the plane of the pulled-open bases and which are separated from one another by a gap through which the tubular web is feedable by feeding means in a plane substantially perpendicular to the table plates, and suckers disposed at both sides of the edges of the tubular web end for pulling the edges apart, characterised in that the suckers (25–28) are secured to carriages (9) which are movable in parallel guides (3, 7) of the frame (1) and which can be moved by drive means (4, 10, 11, 12, 13) from their position in which they are pushed together to the pulled-open position of the base.

4,493,687

ARRANGEMENT FOR THE RAISING AND TRANSPORTING OF PACKING CONTAINER BLANKS

Göte L. Bernle, Malmö , Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Mar. 2, 1982, Ser. No. 354,023
Claims priority, application Sweden, Mar. 13, 1981, 8101604
Int. Cl.³ B31B *1/76*
U.S. Cl. 493—310 **19 Claims**

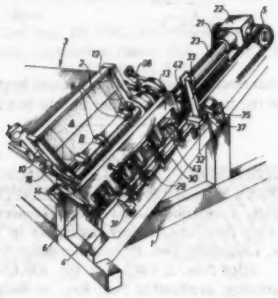
1. An arrangement for transporting and simultaneously unfolding container blanks, comprising:

a magazine for holding a plurality of flattened container blanks;

conveyor means for conveying away the container blanks after they have been unfolded;

a carrier device for transporting the flattened container blanks one at a time from the magazine to the conveyor means, the carrier device being relatively reciprocated along a substantially arc-shaped path of movement between a first position at an outlet end of the magazine and a second position above the conveyor; and,

an unfolding structure for unfolding the container blanks while they are being transported by the carrier device, including a carrier plate and a parallelogram-type support



for the carrier plate, the carrier plate being of a width substantially corresponding to a width of the magazine, the support including two parallel first arms both of which pivot about a first swivelling axis and two parallel second arms both of which pivot about a second swivelling axis, the second axis being parallel to the first axis, wherein the carrier plate is maintained in a substantially vertical orientation throughout the substantially arc-shaped path of movement of the carrier device and wherein a return movement of the carrier plate is unhindered by the unfolded packing containers due to the unfolded packing containers positioned interiorly of the width of the carrier plate within the arc-shaped path of movement of the carrier plate.

4,493,688

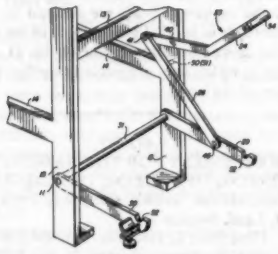
PAPER ROLL FEED RACK FOR PROCESSING MACHINE

Earnest B. Bunch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021

Filed Sep. 30, 1982, Ser. No. 428,937

Int. Cl.³ B65H *45/00*

U.S. Cl. 493—413 **1 Claim**



1. In combination with apparatus for producing continuous form stationery by creasing a strip of paper along transverse lines of weakening formed therealong, said apparatus

a frame,

means, mounted on said frame, for alternately distributing said successive lines of weakening in said paper in substantially opposite directions,

roller means mounted on said frame for drawing said paper from a supply thereof and dispensing said paper into said distributing means,

means carried by said frame for urging said distributed paper into a creased condition, and

means for receiving and transporting said creased paper,

means for removably securing said paper supply in position to dispense paper during the operation of said paper processing apparatus, said securing means comprising, in combination,

(a) a carriage movably connected to said frame and shaped and dimensioned to receive and support said paper supply,

(b) linkage means connected to said carriage and said frame for moving said carriage between at least two operative positions,

(i) a first operative position with said paper supply positioned on and supported by said carriage, and

(ii) a second operative position with said paper supply positioned with respect to said carriage such that said carriage receives and supports said paper supply roll when said carriage is moved to said first operative position, and

(c) means operatively associated with said linkage means for actuating said linkage means to displace said carriage from said first to said second operative position.

4,493,689

PROCESS AND EQUIPMENT FOR MAKING ZIGZAG FOLDS IN LOOPS OF A CONTINUOUS FEED OF FLEXIBLE SHEETING

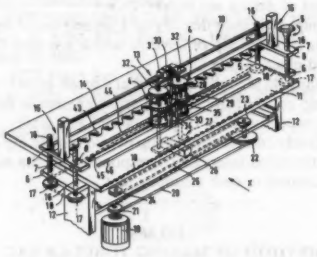
Hans Affüpper, Krautstrasse 55, 5600 Wuppertal 2, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,740

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114395

Int. Cl.³ B65H *29/46*

U.S. Cl. 493—415 **16 Claims**



1. Apparatus for making zig-zag folds in loops of continuous feed of flexible sheeting such as textile sheeting or the like, comprising:

layering means operative to receive a feed of the flexible sheeting and means for moving said layering means back and forth along a path perpendicular to the direction of feed;

said layering means comprising a pair of rolls rotating in the same direction, and having a sheet feed slot between said rolls;

means for mounting said rolls in spaced relationship to each other, with said space being wider than the thickness of the sheeting so that the sheeting lies against only the rearward roll, seen in the direction of movement of the layering means, as the layering means moves back and forth;

means operative to co-rotate both of said rolls in the same

first direction as the layering means moves in one direction along said path, and operative to co-rotate both of said rolls in the same second direction as the layering means moves in the other direction along said path; and

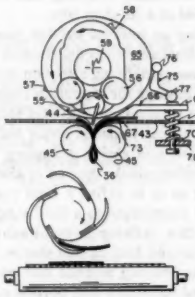
said directions of rotation moving the circumference of the rearward roll in a direction opposite to the movement of the layering means along said path, so that the rearward roll feeds the sheeting in zig-zag folds as the layering means moves back and forth.

4,493,690

CAM ACTIVATED ANTI-DOG-EAR DEVICE

Josef W. Niemiro, Berwyn, and Eugene Skipor, Elmwood Park, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1983, Ser. No. 459,563
Int. Cl.³ B65H *45/18*
U.S. Cl. 493—444 **10 Claims**



1. In an apparatus for quarter folding a half-folded newspaper having folded edges along two sides thereof and loose edges along the remaining two sides thereof, which apparatus includes:

a pair of cooperating fold rolls; a surface located above the fold rolls to receive half-folded newspapers, the surface having a slot through which a newspaper can be moved;

a cage assembly mounted on a shaft for rotation above the newspaper supporting surface;

a tucker blade carried on the rotating cage and movable to tuck a newspaper through the slot in the supporting surface during each revolution of the cage assembly, the combination comprising:

cam means mounted for rotation with the shaft carrying the cage assembly; presser means having a face portion overlaying the surface of the newspaper supporting table immediately adjacent the slot in the table; and means operably connecting said cage assembly shaft means to said presser means whereby said face portion can be moved toward the supporting table to contact the loose edges of each newspaper when it is being drawn downwardly by the fold rolls.

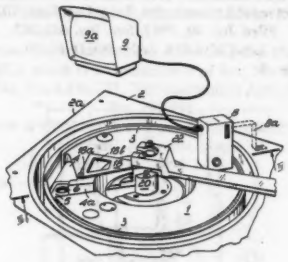
4,493,691

DEVICE FOR PERFORMING PLASMAPHERESIS BY CENTRIFUGATION

Alessandro Calari, Mirandola, Italy, assignor to Dideco S.P.A., Mirandola, Italy

Filed Mar. 14, 1983, Ser. No. 474,925
Claims priority, application Italy, Mar. 25, 1982, 20399 A/82
Int. Cl.³ B04B *15/00*
U.S. Cl. 494—10 **6 Claims**

1. A device for performing plasmapheresis by centrifugation, comprising a body, a rotor rotatably supported by said body and having at its center a support for a connector coupling of the type including a stationary connector block and a rotary connector block in rigid rotatory relationship with the rotor and wherefrom the conveying lines for whole blood, red cells, and plasma extend, supported on said body, a TV camera defining an optical axis, and connected to a TV display, formed on said rotor, a circumferential groove with a widening adapted to accommodate a bag which receives whole blood at one end, and having, at the other end, a substantially tetrahedral shape and being accommodated in the space portion defined between two blocks of a transparent material removably



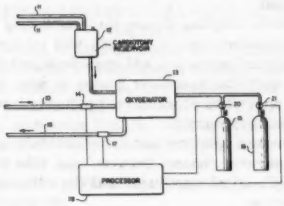
inserted in said widening, and provided with two lines extending substantially from said other end for letting out red cells and plasma, respectively, below said rotor there being provided two stroboscopic flash lights located to face a circular path followed during rotation of said rotor by an opening provided in the rotor through the bottom of said widening, one of said stroboscopic flash lights being arranged at the machine front and the other at any position spaced therefrom and overlaid by said TV camera and in alignment with said optical axis thereof, said optical axis intersecting said circular path.

4,493,692

BLOOD GAS CONCENTRATION CONTROL APPARATUS AND METHOD

Charles C. Reed, 5934 Hornwood, Houston, Tex. 77081

Filed Sep. 29, 1982, Ser. No. 426,777
Int. Cl.³ A61M *1/03*
U.S. Cl. 604—4 **20 Claims**



1. An apparatus for regulating the concentrations of oxygen and carbon dioxide dissolved in blood in an extracorporeal blood circuit, said apparatus comprising:

means for collecting blood from a patient for extracorporeal treatment;

means for monitoring in the extracorporeal blood circuit the concentrations of oxygen and carbon dioxide in the blood prior to extracorporeal treatment;

means for oxygenating the blood;

means for adjusting the concentration of carbon dioxide in the blood;

means for monitoring in the extracorporeal blood circuit the concentrations of oxygen and carbon dioxide in the blood after extracorporeal treatment; and

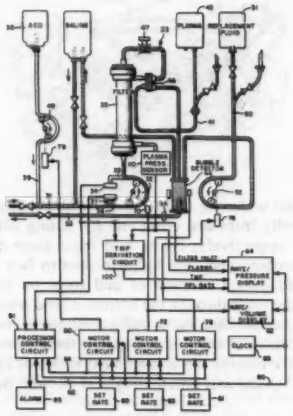
means for returning the blood to the patient after extracorporeal treatment.

4,493,693

TRANS-MEMBRANE PRESSURE MONITORING SYSTEM

Arnold C. Bilstad, Deerfield; John T. Foley, Wheeling, and Walker P. Woodworth, Vernon Hills, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 30, 1982, Ser. No. 403,362
Int. Cl.³ A61A *1/03*; B01D *19/00*
U.S. Cl. 604—6 17 Claims



1. A trans-membrane pressure monitoring system for use in conjunction with a fluid fractionation system of the type having a microporous membrane filter device including an inlet for whole fluid and an outlet for separated fluid component, comprising:

a first electrical transducer having an inlet port responsive to an applied pressure for producing a first pressure-indicative signal;

first pressure coupling means for establishing a pressure communication channel between said inlet port of said first electrical transducer and one side of said filter device;

a second electrical transducer having an inlet port responsive to an applied pressure for producing a second pressure-indicative signal;

second pressure coupling means for establishing a pressure communication channel between said inlet port of said second electrical transducer and the other side of said filter device;

each of said pressure coupling means including a first conduit portion integral with the associated side of said filter device, and a second conduit portion disconnectable from said first portion and integral with respective one of said transducers;

each of said coupling means further including in said first portion of a microporous barrier plug means for providing a determined integration constant in the associated one of said channels;

differential pressure derivation means responsive to said first and second pressure signals for producing an output signal indicative of the differential pressure across the membrane; and

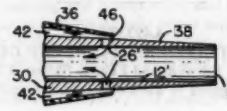
display means responsive to said output signal for displaying said differential pressure in operator readable format.

4,493,694

SURGICAL PRE-ASPIRATOR

David G. Wuchinich, New York, N.Y., assignor to Cooper LaserSonics, Inc., Santa Clara, Calif.

Continuation of Ser. No. 197,869, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 825,217, Apr. 10, 1979, abandoned. This application May 25, 1984, Ser. No. 614,691
Int. Cl.³ A61B *17/20*
U.S. Cl. 604—22 4 Claims



1. An ultrasonic surgical apparatus, comprising:

a hollow concentric surgical tool having a longitudinal axis;

means for ultrasonically vibrating said tool for fragmenting body material at a surgical site;

said tool having an internal suction passage formed along said longitudinal axis for connection to a source of suction;

said suction passage defining a suction port at an open end of said suction passage for aspirating fragmented body material from the surgical site into said suction passage;

a sleeve concentrically spaced about and free from contact with said tool, said sleeve extending longitudinal along said tool to substantially the end of said tool adjacent said suction port so as to define a fluid supply passage about said tool for connection to a fluid supply source;

said sleeve further defining an open annular orifice around said tool at an end face of said sleeve;

said tool further having at least one pre-aspirating orifice means formed through a wall portion of said tool disposed within said sleeve for admitting at least some fluid into said suction passage; and

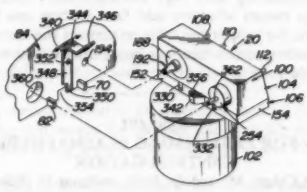
said pre-aspirating orifice means, said suction source, said fluid supply passage and said suction passage each dimensioned to provide means for pre-aspirating substantially all of said fluid through said at least one pre-aspirating orifice so as to prevent substantially all of said fluid flowing from said fluid supply source from reaching said surgical site.

4,493,695

OPTHALMIC MICROSURGICAL SYSTEM CASSETTE ASSEMBLY

Kenneth P. Cook, Blue Bell, Pa., assignor to Site Microsurgical Systems, Inc., Horsham, Pa.

Filed Jun. 1, 1982, Ser. No. 383,635
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—27 22 Claims



14. A opthalmic microsurgical system comprising:

a console including a source of vacuum and control means;

remotely connected means adapted to be disposed in the vicinity of the surgery situs and including an inlet;

first conduit means coupled to said inlet and said vacuum source for carrying material away from said surgery situs; and,

a cassette assembly means arranged for releasable securement to said console;

said control means including first means cooperating with said cassette assembly means for selectively isolating said vacuum source from said first conduit means;

said cassette assembly means comprising:

a body portion;

a collection vessel;

first port means communicating with said first conduit means;

second port means communicating with said vacuum source;

first flexible occludable means on said cassette coupled between said first and second port means and cooperating with said first means in response to a first signal to isolate said vacuum source from said first conduit means;

said collection vessel being coupled to said first conduit means to collect material extracted from said surgery situs.

4,493,696

HEMODIALYSIS CANNULAR FOR SUBCLAVIAN INSERTION

Peter R. Uldall, Willowdale, Canada, assignor to Allentyne Limited, Willowdale, Canada

Continuation of Ser. No. 160,316, Jun. 17, 1980, abandoned. This application May 4, 1984, Ser. No. 608,257

Claims priority, application Canada, Dec. 28, 1979, 342787

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—43 **9 Claims**

1. A double lumen cannula suitable for insertion into a large vein such as the subclavian vein of a patient for blood removal therefrom and blood return thereto, said cannula comprising

an elongated flexible tubular outer member comprising a main elongated portion of first cross section, an integral convergent section having a smooth continuous outer surface and a flexible distal end portion having a second cross section which is smaller than said first cross section

a plurality of blood flow apertures, spaced apart from one another in the side wall of said main portion of said first cross section adjacent the convergent section;

at least one blood flow aperture disposed centrally in the tip of said flexible distal end portion;

an elongated flexible tubular inner member having an opening at each end and having a cross section smaller than said first cross section, the inner member being disposed within the outer member, the distal end of said inner member being disposed in substantially sealing end contact with the convergent section of the outer member so as to form, with the outer member, a pair of concentrically arranged discrete fluid flow lumens, the inner lumen constituted by said inner member and said distal end portion of the outer member, the outer lumen constituted by the main portion and the convergent section of the outer member;

the inner member being releasable and withdrawable from within the outer member.

4,493,697

METHOD AND APPARATUS FOR PUMPING BLOOD WITHIN A VESSEL

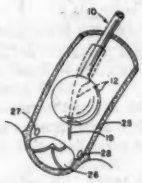
Horst E. Krause, P.O. Box 617, Freeport, Tex. 77541, and Edwin L. Stanley, 2566 S. Patterson Blvd., Dayton, Ohio 45409

Continuation-in-part of Ser. No. 037,766, May 10, 1979, Pat. No. 4,284,073, which is a continuation of Ser. No. 841,017, Oct. 11, 1977, Pat. No. 4,154,227. This application Aug. 14, 1981, Ser. No. 292,991

The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—50 **15 Claims**



1. A method for perfusing a body organ or tissue with blood or a blood substitute, comprising the steps of connecting the organ or tissue to pump means with a conduit, and pulsating the blood or blood substitute within the tissue or organ by operating the pump means at a frequency substantially greater than the normal pulsation frequency of the heart to produce an amplified dynamic pressure wave form in the blood or blood substitute within the microcirculatory vessels to increase the penetration of the blood or blood substitute into the body tissue or organ.

4,493,698

METHOD OF PERFORMING OPTHALMIC SURGERY UTILIZING A LINEAR INTRA-OCULAR SUCTION DEVICE

Carl C. T. Wang, Piedmont, Calif.; Steve Charles, Memphis, Tenn., and Joseph T. Buckingham, Moraga, Calif., assignors to Cooper Medical Devices, San Leandro, Calif.

Division of Ser. No. 203,143, Nov. 3, 1980, Pat. No. 4,395,258. This application Feb. 28, 1983, Ser. No. 470,209

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—51 **4 Claims**

1. A method for performing ophtalmic surgery comprising the following steps:

adapting a cannula to be inserted into the surgical zone;

inserting the cannula into the surgical zone;

maintaining a debris receptacle at a selectable vacuum level for receiving material from the surgical zone, including the steps of

(1) decreasing the vacuum level of the receptacle through an exhaust valve by automatically and continuously communicating between a transducer, a conduit and a exhaust valve such that the exhaust valve is automatically opened when there is an excessive vacuum level detected in the receptacle,

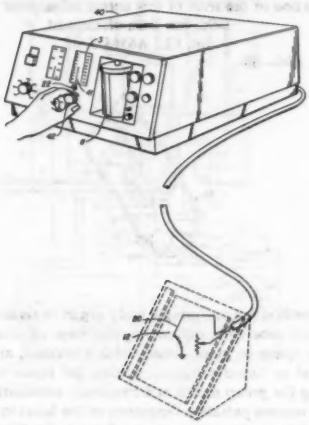
(2) increasing the vacuum level of said receptacle by automatically and continuously communicating between the transducer and the conduit to automatically open the conduit between the vacuum supply and the receptacle to increase the vacuum level of the recepta-

cle when an insufficient vacuum level is detected in the receptacle,

(3) maintaining a first potentiometer at a predetermined level to represent the maximum vacuum level at which said receptacle may be maintained,

(4) periodically setting a second potentiometer at a value representing a percentage of the value of the first potentiometer where the percentage value is the vacuum level at which the receptacle is maintained for a given application,

(5) communicating with the vacuum supply and the exhaust valve for comparing the percentage value of the second potentiometer with the detected vacuum level of the pressure transducer to open the conduit and the exhaust valve in response to an insufficient and an excessive level, respectively, in the debris receptacle;



maintaining a vacuum supply at a predetermined level for varying the vacuum level of the debris receptacle in order that the debris receptacle may be maintained at a selectable vacuum level;

communicating between a vacuum supply, a debris receptacle, and the cannula with a conduit to selectively increase and decrease the vacuum level of the receptacle when the vacuum of said receptacle is greater or lesser than a predetermined selectable vacuum level; and

automatically and continuously monitoring the vacuum level of said receptacle with a pressure transducer in order that any variance in the vacuum level of said receptacle may be instantaneously corrected by either increasing or decreasing the vacuum level of said receptacle.

4,493,699

CONTRACEPTIVE METHODS

Ronald E. Zimmerman, Danville; Philip J. Burck, Indianapolis; C. David Jones, Indianapolis, and Arvind L. Thakkar, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 8, 1982, Ser. No. 366,889

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ A61K *9/02*

U.S. Cl. 604—55 **9 Claims**

1. A method of contraception in a female mammal which comprises continuously introducing within the vaginal cavity of said female, over a prolonged period of time at a controlled rate, a contraceptively effective amount of an alkyl or alkenyl sulfate salt of the formula:

$$R—OSO_3—M$$

wherein R is:

(a) C_{11}–C_{30} straight chain alkyl or alkenyl;

(b) C_{10}–C_{30} branched chain alkyl or alkenyl, the α-carbon of which is not branched; or

(c) C_{13}–C_{30} branched chain alkyl or alkenyl, the α-carbon of which is branched;

or of an alkyl or alkenyl sulfoalkylalkanoate salt of the formula

$$R^2—\overset{O}{\overset{\|}{C}}O—(CH_2)_nSO_3M \qquad II$$

wherein R^2 is alkenyl or straight chain alkyl of from 9–13 carbon atoms or a branched chain alkyl of from 9–17 carbon atoms; and n is 2, 3 or 4;

or of an alkyl sulfonate salt of the formula

$$R^1SO^3M \qquad III$$

wherein R^1 is straight or branched alkyl of from 11–16 carbon atoms; and M is a pharmaceutically acceptable non-toxic cation; by means of a biologically compatible prolonged release carrier therefor whereby the compound is transported into the uterine fluids with sperm during or after coitus.

4,493,700

PROTECTIVE SHEATH FOR AN ARTIFICIAL INSEMINATION GUN, IN PARTICULAR FOR BOVINES

Robert Cassou, 1 rue Clémenceau; Maurice Cassou, Rue Clémenceau, and Bertrand Cassou, Saint Symphorien des Bruyeres, all of 61300 L'Aigle, France

Filed Sep. 28, 1982, Ser. No. 425,287

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—55 **4 Claims**

1. A cylindrical flexible protective sheath insertable into an animal during use with an artificial insemination gun, the sheath having a substantially constant wall thickness throughout the length of the sheath and having an open insemination end portion of a narrowed shape and an opposite sheath-fixing end portion having a very short length relative to the total length of the sheath and a free inside diameter substantially larger than a constant free inside diameter that the sheath has between said end portions.

4,493,701

WOUND DRAINAGE DEVICE OF RESILIENT SIDEWALLS WITH A CONSTANT RATE OF RECOVERY

Matthew W. Bootman, Goleta; Peter Schillke, and Stephen W. Laguette, both of Santa Barbara, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 19, 1982, Ser. No. 409,671

Int. Cl.³ A61M *1/06*

U.S. Cl. 604—73 **23 Claims**

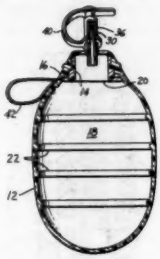
1. A wound drainage reservoir comprising:

a container having a resilient sidewall defining a chamber within the container, which sidewall includes resilient means for providing a substantially constant rate of recovery for the sidewall to its original configuration after having been collapsed, and an opening extending through the sidewall to the chamber;

a helmet extending through the opening having an outwardly extending lip extending circumferentially around the helmet, which lip engages an inside surface of a portion of the sidewall of the container which surrounds the

opening the helmet further having an indented portion which projects outwardly from the opening;

a collar means encircling and bonded to a portion of the helmet which projects outwardly from the opening for sealing such portion of the sidewall between the lip of the helmet and such collar means;



a first inlet means on the helmet for providing a first fluid-flow conduit to the chamber;

a second inlet means on the helmet for providing a second fluid-flow conduit to the chamber;

a drainage outlet means on the helmet for providing a fluid-flow conduit from the chamber; and

a plurality of ribs extending laterally along the sidewall.

4,493,702

PARENTERAL ADMINISTRATION USING OSMOTICALLY MOTIVATED DELIVERY SYSTEM

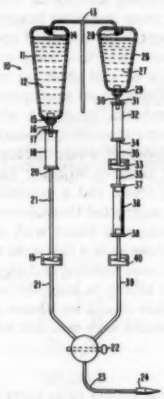
John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 325,206, Nov. 27, 1981, Pat. No. 4,432,756. This application Oct. 17, 1983, Ser. No. 542,466

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ A61M 5/00

U.S. Cl. 604—80 **3 Claims**



1. A parenteral delivery set for administering a beneficial agent formulation to a warm-blooded animal, the delivery set comprising:

(a) a primary tube for the flow of a parenterally acceptable fluid therethrough;

(b) a secondary tube for the flow of a parenterally acceptable fluid therethrough;

(c) a formulation chamber having means for establishing communication with the secondary tube, the formulation chamber comprising:

(1) a wall that surrounds an internal lumen;

(2) an inlet in the wall for letting a parenterally acceptable fluid enter the formulation chamber;

(3) a beneficial agent osmotic delivery device in the formulation chamber, the delivery device comprising:

(i) a wall formed of a semipermeable composition that surrounds and forms a compartment, (ii) a beneficial agent in the compartment, and (iii) a passageway in the wall of the delivery device connecting the compartment with the formulation chamber;

(4) an outlet in the wall for letting an agent formulation leave the formulation ch. mber;

(d) a common tube having means for communicating with the primary tube for receiving parenterally acceptable fluid from the primary tube, and for communicating with the secondary tube for receiving parenterally administrable agent formulation from the secondary tube.

4,493,703

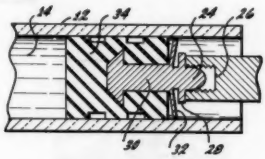
HYPODERMIC SYRINGE CARTRIDGE WITH NON-RETRACTABLE DRIVE PISTON

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Continuation-in-part of Ser. No. 542,084, Oct. 17, 1983, abandoned, which is a continuation of Ser. No. 363,927, Mar. 31, 1982, abandoned. This application May 14, 1984, Ser. No. 609,520

Int. Cl.³ A61M 5/00

U.S. Cl. 604—110 **2 Claims**



1. An insert, part of which is permanently embedded within the drive piston that is pushed by an actuating rod within the tubular member of a hypodermic syringe to expel fluid from the hypodermic syringe, characterized in that said insert simultaneously serves the dual purposes of preventing retraction of the drive piston from any position along the tubular member to which the drive piston has been advanced and of preventing penetration of the drive piston by a hypodermic needle, thereby rendering the hypodermic syringe pilfer-proof, said insert comprising:

a resilient element spanning the bore of the tubular member when inside the tubular member, impenetrable by a hypodermic needle, and extending radially when removed from the tubular member to a diameter greater than the bore of the tubular member so that peripheral portions of said resilient element are forced to bow rearward when the drive piston is inserted into the tubular member from the rear;

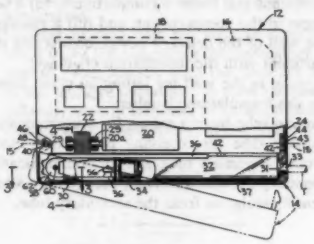
said peripheral portions frictionally contacting the inside wall of the tubular member, the friction between said peripheral portions and the inside wall resisting rearward motion of the drive piston at all positions of the drive piston within the tubular member so that any attempt to pull the drive piston toward the rear of the tubular member will force said peripheral portions to jam even more tightly against the inside wall of the tubular member, thereby preventing retraction of the drive piston at all positions of the drive piston within the tubular member.

4,493,704

PORTABLE FLUID INFUSION APPARATUS

Robert W. Beard, Placerville, and Russell F. Kirk, Sunnyvale, both of Calif., assignors to OXIMETRIX, Inc., Mountain View, Calif.

Filed Nov. 29, 1982, Ser. No. 445,276
Int. Cl.[3] A61M 5/20
U.S. Cl. 604—154 24 Claims



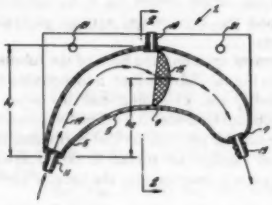
1. Portable fluid infusion apparatus comprising a syringe for holding a predetermined quantity of an injectable liquid to be delivered to a patient, a piston within the body of the syringe for ejecting liquid therefrom, a flexible member connected to said piston within the body of the syringe and extending in a path bent sharply away from the axis of the syringe, and means for driving the flexible member into the body of the syringe in a controlled manner for dispelling said liquid from the syringe.

4,493,705

BLOOD RESERVOIR

Lucas S. Gordon, and Jeanne Pierson, both of Irvine, Calif., assignors to Bentley Laboratories, Inc., Los Angeles, Calif.

Filed Aug. 10, 1982, Ser. No. 406,962
Int. Cl.[3] A61M 1/03; B01D 19/02
U.S. Cl. 604—122 10 Claims



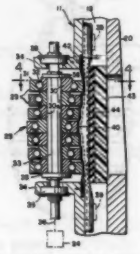
1. A blood reservoir comprising:
a substantially inverted U shaped reservoir chamber having first and second U legs joined by a U midsection;
a substantially cylindrical inlet at the base of said first U leg said inlet aligned such that its centerline projects upwardly from the centerline of said first U leg;
an outlet at the base of said second U leg; and a vent at the uppermost portion of the U midsection.

4,493,706

LINEAR PERISTALTIC PUMPING APPARATUS AND DISPOSABLE CASETTE THEREFOR

Alexander S. Borsanyi, Newport Beach, and Donald E. Bobo, Fountain Valley, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 12, 1982, Ser. No. 407,440
Int. Cl.[3] A61M 5/00
U.S. Cl. 604—153 16 Claims



1. A linear peristaltic pump apparatus comprising a housing having an opening therein; a shaft rotatably supported within said housing adjacent said opening; means for rotating said shaft; a series of bearing assemblies within said housing each having concentric inner and outer bearing members; said inner member being eccentrically mounted upon said shaft with the centers of said inner members being arranged to describe a helix about the axis of said shaft; an elastomeric membrane secured to said housing about said opening and covering said opening; said membrane extending along and tangentially engaging the outer members of said bearing assemblies along a first linear zone of contact; a casette removably and externally supported by said housing adjacent to said membrane and comprising a rigid frame and a generally straight section of elastomeric tubing supported thereby; means provided by said housing for orienting said frame with said section of tubing lying in the same plane as said first zone of contact; and platen means provided by said housing and engagable with said section of elastomeric tubing to urge the same into engagement with the opposite side of said membrane along a second linear zone of contact parallel with said first zone of contact.

4,493,707

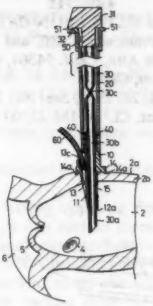
TUBAGE USED FOR INTUBATION

Yoshihisa Ishihara, Hiroshima, Japan, assignor to Japan Medical Supply Co. Ltd., Hiroshima, Japan

Filed Apr. 4, 1983, Ser. No. 482,090
Claims priority, application Japan, Feb. 10, 1983, 58-017476[U]
Int. Cl.[3] A61M 5/00
U.S. Cl. 604—164 11 Claims

1. A tubage for use in an intubation which comprises:
a first tubular body having a first conduit and a second

conduit formed respectively to extend in the longitudinal direction of said first tubular body, a flange portion extending in the direction substantially perpendicular to said longitudinal direction, and a side hole formed to open to the first conduit at a predetermined distance from said flange portion;



a flexible second tubular body connected at its one end to one end of said first conduit so as to communicate with said first conduit;

a hollow needle removably received by said first conduit and by said flexible second tubular body; and

a liquid seal means provided between the inner surface of said second tubular body and the outer surface of said hollow needle.

4,493,708

INTRAVASCULAR CATHETER ASSEMBLY

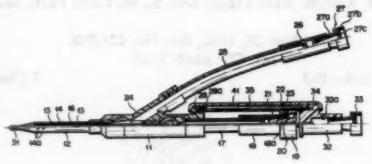
Yasuhiko Sugisawa, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

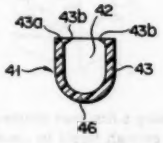
Filed Sep. 21, 1982, Ser. No. 420,814

Claims priority, application Japan, Dec. 10, 1981, 56-182852[U]

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—165 **15 Claims**





2. An intravascular catheter or cannula assembly comprising:

catheter means including a catheter hub and a flexible catheter tube which has a longitudinal bore and a proximal end of which is fixed to said catheter hub;

cannula means including a hollow cannula body which is detachably inserted into said longitudinal bore and a distal end of which is arranged to project from a distal end of said catheter tube, and a cannula hub which supports said cannula body at a proximal end thereof;

means for regulating a length of the distal end of said cannula body projecting from the distal end of said catheter tub, said cannula projecting length regulating means including a cannula positioning rod, a proximal end of which is fixed on an outer surface of said cannula hub through a fixing member and a distal end of which projects parallel to said cannula body and a rod stopper means which is mounted on an outer surface of said catheter hub to abut against a distal end of said cannula positioning rod, thereby regulating the length of the distal end of said cannula body projecting from the distal end of said catheter tube; and

preventing means for preventing axial movement of said cannula means when said cannula body is inserted into said longitudinal bore of said catheter tube, said cannula axial movement preventing means having a side wall and a bottom wall defining a groove which tightly detachably receives said fixing member and said rod stopper means, said side wall and said bottom wall extending along the axial direction of said cannula positioning rod, said side wall having a thin projection which extends inwardly from an upper end of said side wall so as to snap in said fixing member and said rod stopper means into said groove.

4,493,709

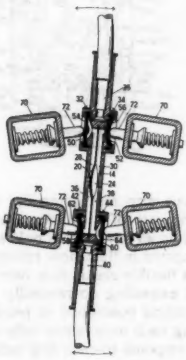
METERING DEVICE FOR INTRAVENOUS FLUIDS

Gordon E. Smith, Carrollton, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Filed Jan. 25, 1982, Ser. No. 342,100

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—246 **8 Claims**



1. A metering device for monitoring and controlling the flow of intravenous fluid at a preselected overall volumetric flow rate comprising:

a metering chamber (14) having a fixed accurately preselected volume equal to a standard drop size no greater than 0.1 milliliters;

a pressure transmitting member (20) dividing the metering chamber (14) into first and second compartments (22, 24);

respective inlet and outlet tubes (28, 30, 36, 38) connected to each of the first and second compartments (22, 24) in the metering chamber (14);

valve means (32, 34, 42, 44) connected to each of the respective inlet and outlet tubes (28, 30, 36, 38) connected to each of the first and second compartments (22, 24) in the metering chamber (14);

main inlet (26) and outlet (40) tubes, each of which connects to the respective inlet tubes (28, 30) or outlet tubes (36, 38) connected to the two compartments (22, 24) in the meter-

ing chamber (14) the main outlet tube (40) being free from downstream rate-control occlusions; and

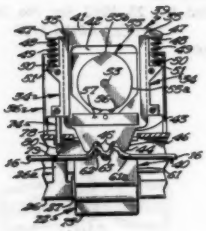
timing and valve operator means for controlling the operation of the valve means (32, 34, 42, 44) so as to repetitively and alternatively allow fluid flow into and out of each of the two compartments (22, 24) formed in the metering chamber (14) for a time period sufficiently long to allow the compartments to completely fill and empty alternatively, the volume of each of the compartments (22, 24) being equal in volume to the volume of the metering chamber (14) when that compartment is filled so that a pulse of fluid precisely equal to the standard drop size in volume is introduced into the main outlet tube (40) and into the patient upon each switching of the valve means (32, 34, 42, 44) by the timing and valve operator means; the timing and valve operator means constructed so that the time period between valve means operations is equal to the quotient of the metering chamber volume divided by the preselected overall volumetric flow rate, the time period thus being independent both of the instantaneous flow rate and of the positioning of the pressure transmitting member.

4,493,710

INTRAVENOUS DRIP RATE CONTROL DEVICE

Roger A. King, and John E. Arnold, Jr., both of Minneapolis, Minn., assignors to Ivy Medical, Inc., Minneapolis, Minn.

Filed Nov. 14, 1983, Ser. No. 550,803
Int. Cl.³ A61M 5/00
U.S. Cl. 604—250 **7 Claims**



1. An intravenous drip rate controller device for use in controlling the drip rate of a solution from an intravenous container mounted on an intravenous pole stand and having a drip chamber connected in fluid flow relation with said intravenous chamber, a flexible elastic drip tube connected to the drip chamber and extending downwardly therefrom, and a drip rate sensing means positioned in proximity to the drip chamber for sensing each intravenous drip and generating an electrical signal in response to each drip indicative of the drip rate, said device comprising:

a support structure mounted on said intravenous pole stand,

a control valve on said support for controlling the drip rate of the solution including opposed valve members each having projections and recesses arranged in interdigitating relation with the projections and recesses on the other valve member to define undulating clamping surfaces,

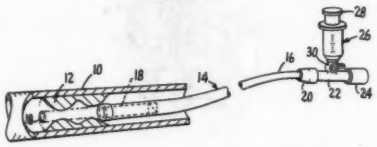
means supporting one of said valve members for shifting movement of said one valve member toward and away from the other valve member whereby when said one valve member is shifted toward the other valve member, a portion of the drip tube extending horizontally between and along said undulating clamping surfaces of the valve members will be engaged and stretched in a direction longitudinally of the tube by the interdigitating projections and recesses defining the undulating clamping surfaces to progressively reduce the opening in that length of the drip tube engaged by the undulating clamping surfaces to thereby reduce the drip rate through the stretched portion, and when one said valve member is shifted away from the other valve member, the tension on the elastic drip tube will be progressively relaxed to permit the drip tube to return to its original unstretched condition and thereby increase the drip rate of the solution passing therethrough.

4,493,711

TUBULAR EXTRUSION CATHETER

Albert K. Chin, San Francisco, Calif., and Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304, assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed Jun. 25, 1982, Ser. No. 392,279
Int. Cl.³ A61M 25/00
U.S. Cl. 604—271 **5 Claims**



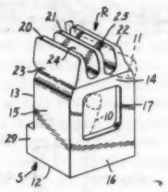
1. A catheter comprising an elongated flexible tubular catheter body, a non-elastomeric flexible tube of a generally uniform diameter over the entire length thereof at least one to two times that of the outer diameter of the catheter body, said tube having first and second initially open ends, the first end being closed by being folded externally several times upon itself and then turned outside-in so as to be secured within the tube, and then being inserted into said body, the second end being turned inside-out and being sleeved over and secured to the distal end of said body, said folded and closed first end being adapted to remain folded and closed upon the application of pressurized fluid thereto through the catheter body to cause the eversion of said tube from said body and said folded and closed end being adapted at the end of eversion movement of said tube to flip to an inside-out condition and open under continued application of pressurized fluid.

4,493,712

FOOT SOAKER AND RESTER

Ronald J. Kampff, 3033 Toledo Ave. S., St. Louis Park, Minn. 55416

Filed Sep. 28, 1982, Ser. No. 424,895
Int. Cl.³ A61F 7/00
U.S. Cl. 604—293 **7 Claims**



1. A device comprising a first part adapted to receive a foot of a human and hold enough liquid to cover said foot, and a second part adapted to support the other foot of said human in a generally upright position of limited turning movement while said first named foot is in the liquid housed by said first part,

wherein said parts are separable, and means for maintaining said parts in connected spaced apart relationship,

and wherein said first part has an upwardly facing top surface and said second part has a downwardly facing bottom surface opposing said top surface and adapted to engage and be supported by said top surface, and

wherein said means for maintaining said parts in spaced apart relationship comprises spacer means insertable between said parts and adapted to engage said top and bottom surfaces whereby said spacer means is supported by said first part and supports said second part.

4,493,713

ADDED FEATURE TO DISPOSABLE DIAPERS

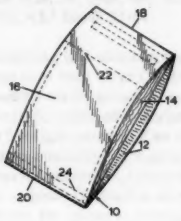
Alexander P. Izzo, 10 Printer Ct., Huntington Station, N.Y. 11746

Filed Jul. 22, 1982, Ser. No. 400,627
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—385 **7 Claims**

1. A disposable diaper, comprising: an absorbant layer having opposing sides;

a backing sheet attached to one side of the absorbant layer; and

a removable bag having opposing first and second ends, a storage pouch on one surface thereof, and retained onto the opposite side of said absorbant layer so as to cover said absorbant layer and have said absorbant layer sandwiched between said backing sheet and said bag, said bag being attached to said backing sheet by said first and second ends with said pouch facing said absorbant layer, whereby said bag must be separated from the absorbant layer and removed to expose said absorbant layer for application of



the diaper onto a person, said bag once removed now being available for disposal into the storage pouch of said bag of a diaper which is now soiled.

4,493,714

ULTRATHIN FILM, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF FOR CONCENTRATING A SPECIFIED GAS IN A GASEOUS MIXTURE

Fumio Ueda; Eiichi Hashimoto; Takeyoshi Yamada, and Koh Mori, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 4, 1983, Ser. No. 491,536

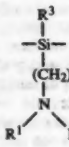
Claims priority, application Japan, May 6, 1982, 57-74476; Sep. 17, 1982, 57-160810; Sep. 17, 1982, 57-160811; Sep. 17, 1982, 57-160814

Int. Cl.³ B01D 53/22

U.S. Cl. 55—16 21 Claims

1. An ultrathin film composed substantially of silicon-containing polyurea comprising polyaddition bonded units derived from

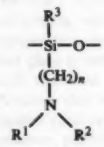
(A) at least one polyamine selected from the group consisting of silicon-containing polyamines having in the molecule at least two units of the following formula



(I)

wherein R^3 represents a monovalent hydrocarbon group or a fluorocarbon group, R^1 and R^2 are identical or different and represent a hydrogen atom or a monovalent hydrocarbon group which may have a primary or secondary amino group, or R^1 and R^2 may be bonded to each other to form an alkylene group interrupted by the nitrogen atom forming the secondary amino group, and n is an integer of 1 to 10, provided that R^1 and R^2 are not simultaneously aliphatic, alicyclic or aromatic groups free from the amino group,

not all, but at least one, of the units of formula (I) forming a unit represented by the following formula



(I)-a

wherein R^1, R^2, R^3 and n are as defined, the free bond from the silicon atom is bonded directly to another carbon atom or another oxygen atom, and the free bond from the oxygen is bonded directly to another siloxane atom,

and hydrocarbon-type polyamines containing at least two primary or secondary amino groups in the molecule, and

(B) at least one polyisocyanate compound selected from the group consisting of silicon-containing polyisocyanates having at least 2 isocyanate groups in the molecular chains and hydrocarbon-type polyisocyanates having at least 2 isocyanate groups in the molecular chains;

provided that when the polyisocyanate compound is the hydrocarbon-type polyisocyanate alone, at least one of the selected polyamines is a silicon-containing polyamine containing in the molecule at least one unit of formula (I)-a in which the free bond from the silicon atom is bonded to a monovalent hydrocarbon group.

4,493,715

REMOVAL OF CARBON DIOXIDE FROM OLEFIN CONTAINING STREAMS

John P. Hogan; Charles R. Nease, both of Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 451,291, Dec. 20, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,134

Int. Cl.³ B01D 53/04

U.S. Cl. 55—68 6 Claims

1. A method for removing low concentrations of CO_2 from a gaseous olefin stream of at least C_2 to C_4 olefins which comprise passing said gaseous olefin stream containing CO_2 into contact with a regenerable, calcined adsorbent consisting essentially of from 1 to 6 weight percent of an alkali metal oxide selected from the group consisting of sodium, potassium and lithium on alumina, said regenerable, calcined adsorbent having been made by (a) contacting alumina with an alkali metal compound selected from the group consisting of sodium, potassium or lithium compounds which are convertible to the metal oxide on calcination, (b) drying the resulting alkali metal compound, treated alumina, and (c) thereafter calcining the dried treated alumina.

4,493,716

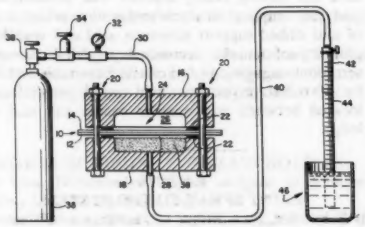
APPARATUS FOR THE SEPARATION OF HYDROGEN SULFIDE FROM A GAS MIXTURE

Robert H. Swick, Newcastle, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 12, 1982, Ser. No. 433,889

Int. Cl.³ B01D 53/22

U.S. Cl. 55—158 15 Claims



1. A flexible layered membrane for use in separating hydrogen sulfide from a mixture of gases in a continuous flow-through process, said membrane comprising:

a. a fine textured support layer permeable at least to hydrogen sulfide and having pores occludable by a very thin coating; and

b. a selective permeability pellicle of cured polysulfide polymer having a separation factor favoring hydrogen sulfide adhered to a surface of said support layer and occluding the pores thereof.

13. Apparatus for removing hydrogen sulfide from a mixture of gases, comprising:

a. a flexible layered membrane including:

(i) a fine textured support layer permeable at least to hydrogen sulfide gas and having pores occludable by a very thin coating; and

(ii) a selective permeability pellicle of cured polysulfide polymer having a separation factor favoring hydrogen sulfide adhered to a surface of said support layer occluding the pores thereof;

b. means for conducting said mixture of gases under pressure along one surface of said layered membrane; and

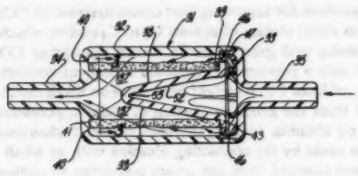
c. means for removing gas emerging from the surface of said layered membrane opposite said one surface thereof.

4,493,717

IN-LINE DISPOSABLE FILTER

L. Joseph Berger, Jr., 19661 Beverly Rd., and Denis D. Guequierre, 320 Argyle, both of Birmingham, Mich. 48009

Filed May 6, 1982, Ser. No. 375,536
Int. Cl.³ B01D 50/00, 46/24
U.S. Cl. 55—330 8 Claims



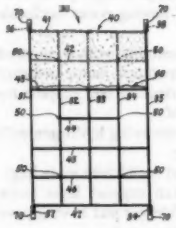
1. A filter assembly including:
(a) a filter housing having a fluid inlet and a fluid outlet,
(b) a filter tube mounted within said filter housing between said inlet and outlet, and
(c) a ribbed support structure permanently mounted within said housing and supporting said tube along substantially its entire length,
(d) said housing comprising a female portion and a male portion permanently joined together,
(e) an annular recess at one end of said female portion, said male portion having an annular ledge at one thereof and extending into said annular recess,
(f) said ribbed support structure being connected to the interior of said filter housing and comprising a plurality of axially and radially extending ribs supporting said filter tube and having axially tapered wall portions between said ribs, a support structure end wall provided at one end of said ribbed support structure, said end wall having a plurality of annular serrations provided thereon, said serrations engaging an end of said filter tube, and a plurality of radial projections, said radial projections being located between said annular recess and said annular ledge.

4,493,718

PAINT SPRAY FILTER SYSTEM

Randy Schweizer, Park Ridge, Ill., assignor to Chemco Manufacturing Co., Inc., Skokie, Ill.

Filed Mar. 31, 1983, Ser. No. 480,783
Int. Cl.³ B01D 39/04
U.S. Cl. 55—491 2 Claims



1. A paint spray filter for use in a paint spray booth characterized by a pair of substantially parallel side panels, an end panel interconnecting said side panels, a top panel overlying said side panels and said end panel, means defining access to said booth from the front of said booth, and frame means disposed intermediate said end panel and said access, comprising:

a grid comprising a plurality of parallel vertical members including a first pair of said vertical members defining the vertical edges of said grid and being substantially twenty-four inches apart, and a second pair of said vertical members being located substantially twelve inches apart and substantially six inches from respective ones of said first pair of said vertical members; a plurality of parallel horizontal members including a first pair of said horizontal members defining the horizontal edges of said grid, and being substantially thirty-six inches apart, and a second pair of said horizontal members being located substantially eighteen inches apart and substantially six inches from respective ones of said first pair of said vertical members, and another one of said horizontal members located substantially midway between said second pair of said horizontal members;

a plurality of attachment spikes secured to said grid, extending outwardly and upwardly therefrom, four of said spikes being located at the intersections of said second pair of said vertical members and said second pair of horizontal members, and two of said spikes being located at the intersections of said second pair of said vertical members and said other one of said horizontal members;

a sheet of fiberglass filter material having a first face substantially covering said grid and being secured thereto by said attachment spikes, and a fully exposed second face; and

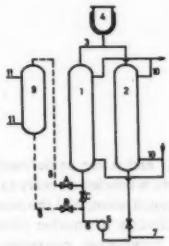
support means extending from the corners of said grid and adapted to cooperate with said frame means of said booth for maintaining said paint spray filter in said booth, whereby said paint spray filter defines a barrier separating said booth into an exhaust area located between said barrier and said end panel, and a spraying area located between said barrier and said access.

4,493,719

METHOD OF SEPARATION BY FRACTIONAL CRYSTALLIZATION FROM A LIQUID MIXTURE

Klaus Wintermantel, Dossenheim; Dieter Stockburger, Gruenstadt, and Hugo Fuchs, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 764,536, Feb. 1, 1977, abandoned. This application Mar. 25, 1983, Ser. No. 479,005
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606364
Int. Cl.³ B01D 9/02
U.S. Cl. 62—532 5 Claims



1. An improved method of separation by fractional crystallization in which a liquid mixture is repeatedly passed in turbulent flow through an indirectly cooled crystallization zone, which crystallization zone is kept full of liquid mixture, and a layer of crystals is crystallized on the walls of the crystallization zone, the liquid remaining after deposition of the layer of crystals on the wall of the crystallization zone being removed, whereupon the surface of the layer of crystals is washed and the crystals are melted by passing through the crystallization zone a melt of similar composition to that of the crystals, wherein the improvement comprises:

carrying out the crystallization in a cascade of two crystalli-

zation zones the liquid mixture rising in the first zone and descending in the second zone, said zones being connected to a loop,

maintaining the liquid mixture throughout the entire crystallization at a temperature equal to or less than the equilibrium temperature of said liquid mixture, wherein the ratio of rate of growth to mass transfer coefficient at the interface is controlled such that it remains coastant or diminishes during crystallization and

continuing the crystallization until a frozen fraction of from 70 to 98% is achieved, said frozen fraction being the percentage of the cross-section of the crystallization zone which is filled with the crystalline product.

4,493,720

PROCESS FOR PRODUCING DOPED VITREOUS SILICA FOR PREPARING A PREFORM FOR AN OPTICAL FIBRE

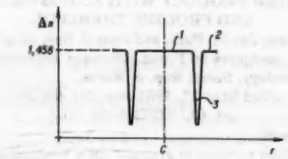
Francis Gauthier, and Jean Gombert, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 7, 1983, Ser. No. 464,556

Claims priority, application France, Feb. 9, 1982, 82 02053

Int. Cl.³ C03C *15/00*; C03B *37/01, 23/00*

U.S. Cl. 65—3.12 **21 Claims**



1. A process for the production of doped vitreous silica and the preparation of a preform for an optical fiber, which process comprises:

(a) melting a dopant-containing batch mixture of oxides and carbonates, which is capable of forming a glass, having a composition such that a separation of phases in the resultant glass is induced by annealing the resultant glass, and such that said separated phases have an interconnected structure due to spinodal decomposition, and refining the molten glass resulting from the melting to obtain a homogeneous, bubble-free glass melt;

(b) forming or shaping said melt and hardening it, to provide a homogeneous glass;

(c) annealing said homogeneous glass, thereby producing a spinodal structure by phase separation, and wherein there is formed a hard phase of silica and at least one doping oxide, and a soft phase comprising the oxides of at least boron and sodium, said phases being interconnected;

(d) etching said glass with one or more mineral acids, thereby dissolving said soft phase to obtain a porous glass consisting essentially of said hard phase;

(e) rinsing said porous glass with distilled water to eliminate elements from said soft phase;

(f) drying said glass by slowly raising the temperature, such that an open porosity is obtained which is 60% higher than the initial porosity;

(g) producing a powder from said porous glass; and

(h) forming a fiber preform from the powder, by deposition of said powder, on a surface as a glass.

4,493,721

METHOD OF MANUFACTURING OPTICAL FIBRES

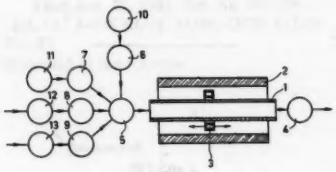
Cornelis P. Auwerda, and Gerrit J. Koel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1983, Ser. No. 482,351

Claims priority, application Netherlands, Apr. 6, 1982, 8201453

Int. Cl.³ C03B *20/00*

U.S. Cl. 65—3.12 **6 Claims**



1. A method of manufacturing an optical fiber comprising the steps of:

providing a glass tube having an inner wall;

etching the inner wall of the tube with a fluorine compound; and then

depositing core glass on the etched inner wall of the tube to form a coating, said core glass being formed by reacting gaseous glass-forming compounds in a nonisothermal plasma;

collapsing the coated tube to form a solid rod; and

drawing the solid rod into a fiber;

characterized in that the step of etching consist essentially of the steps of:

passing a gaseous hydrogen-free fluorine compound through the tube;

forming a nonisothermal plasma in the tube while passing the fluorine compound through the tube; and

reciprocating the plasma along the length of the tube.

4,493,722

METHOD OF PRODUCING GLASS BOTTLES

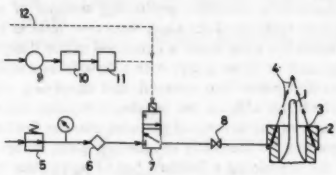
Hiroyuki Ono, Nishinomiya, Japan, assignor to Yamamura Glass Co., Ltd., Nishinomiya, Japan

Filed Aug. 25, 1982, Ser. No. 411,186

Claims priority, application Japan, Sep. 8, 1981, 56-141869

Int. Cl.³ C03C *21/00*; C03B *9/193*

U.S. Cl. 65—30.14 **8 Claims**



1. In a method of producing glass bottles including the steps of feeding a molten glass mass or gob into a blank mold while the blank mold substantially encloses the plunger to provide a substantially closed position, press-molding said gob with a plunger by advancing the plunger into the gob to form a parison, retracting the plunger from the parison, opening the blank mold and inverting said parison for transfer to a blow mold in which it is blown for molding and closing the blank mold into said closed position, the improvement comprising forming an air curtain to enclose the entire plunger within said air curtain for a period of time beginning in the later stages of inverting said formed parison and continuing until blank mold closing

without impinging upon said formed parison with said air curtain, thereby preventing foreign matter from adhering to the plunger.

2. A method as in claim 1, wherein to further increase the mechanical strength of glass bottles, said method is combined with a method of forming a compressive stress surface layer by replacing the Na ions in the glass by ions having greater radii than said Na ions.

4,493,723

METHOD OF AND APPARATUS FOR THERMALLY TOUGHENING GLASS

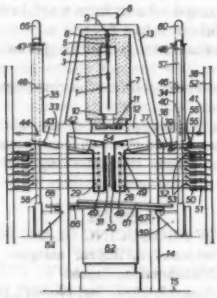
John Evason, Merseyside, England, assignor to Pilkington Brothers P.L.C., Merseyside, United Kingdom

Filed Jan. 26, 1983, Ser. No. 461,123

Claims priority, application United Kingdom, Feb. 1, 1982, 8202768; Oct. 11, 1982, 8229004

Int. Cl.³ C03B *27/04*

U.S. Cl. 65—114 7 Claims



1. A method of thermally toughening glass, comprising quenching a vertically-suspended glass sheet in a gas-fluidised bed of particulate material, projecting streams of particles towards both surfaces of the sheet from two vertical arrays of nozzles when the glass sheet is immersed in the fluidised bed, supplying each of those arrays with a flow from a falling supply of aerated particulate material, and supplying additional gas into the flows adjacent the nozzles to regulate the velocity of projection of the streams of particles into the fluidised bed.

4. Apparatus for thermally toughening glass, comprising:

a tank for containing a fluidised bed of particulate material;

means for immersing glass to be toughened in a fluidised bed in the tank;

a container for a supply body of aerated particulate material;

projecting means adapted to be located in said tank for projecting streams of particles into the fluidised bed towards the glass;

supply means connecting said container to said projecting means; and

gas permeable means in said supply means adjacent said projecting means for the supply of additional gas into said aerated particulate material thereby to regulate the gas pressure in the supply of aerated particulate material to said projecting means.

4,493,724

APPARATUS FOR BENDING GLASS SHEETS

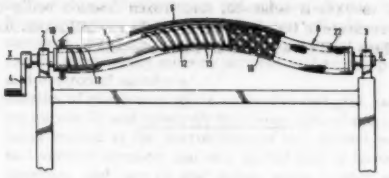
Norbert Schwarzenberg; Heinz Ueberwolf; Friedrich Halberschmidt, all of Herzogenrath, and Joseph Audi, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Sep. 30, 1983, Ser. No. 537,593

Claims priority, application France, Oct. 11, 1982, 82 16970

Int. Cl.³ C03B *13/16*

U.S. Cl. 65—273 7 Claims



1. In apparatus for bending glass, a roller rotatably mounted on a curved portion of a rod, said roller member comprising a tubular metal winding and a flexible sheath of metal meshing both coaxial to the rod and affixed at their ends to each other so that said tubular metal winding and flexible sheath can be rotated together about said rod.

4,493,725

FERTILIZER PRODUCT WITH SUSTAINED ACTION AND PROCESS THEREFOR

Sang H. Moon; Jae M. Park, and Sung S. Suh, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed May 17, 1983, Ser. No. 495,531

Int. Cl.³ C05D *9/00, 9/02*

U.S. Cl. 71—62 14 Claims

1. A fertilizer product in granular form with sustained action comprising a granular fertilizer material coated with a coating material having 1 to 50% by weight of a silicate or silicic acid ester based on the weight of the fertilizer material to be treated, 0.001 to 1.0 part by weight of a metal or non-aqueous metallic compound, 0.001 to 1.0 part by weight of an aqueous metallic compound, 0.001 to 1.0 part by weight of an inorganic mineral, and an optionally high molecular weight organic compound, wherein all parts are based on the weight of the silicate or silicic acid ester used.

4,493,726

PHENYLPYRIMIDINES AS ANTIDOTES FOR PROTECTING CULTIVATED PLANTS AGAINST PHYTOTOXIC DAMAGE CAUSED BY HERBICIDES

Kurt Burdeska, Basel, Switzerland; Guglielmo Kabas, deceased, late of Aesch, Switzerland (by Anni Kabas-Maskulinski, heir); Hans-Georg Brunner, Lausen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

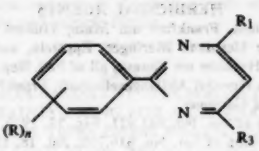
Continuation-in-part of Ser. No. 331,853, Dec. 17, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 486,651

Claims priority, application Switzerland, Dec. 23, 1980, 9522/80; Apr. 8, 1981, 2363/81

Int. Cl.³ A01N *57/10, 43/48;* C07D *239/02*

U.S. Cl. 71—87 29 Claims

1. In a herbicidal composition the improvement which reduces damage to cultivated plants by said composition, which improvement comprises the admixture in said composition of a compound of the formula:



wherein

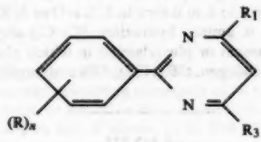
each of R_1 and R_3 independently of the other is chloro, bromo or fluoro;

each R independently is hydrogen, methyl, chloro, bromo, fluoro, methoxy, nitro, hydroxy, trifluoromethyl, ethynyl, amino, acetamido, carboxy, carbomethoxy or acetamidosulfonyl; and

n is 1 or 2,

wherein the ratio of herbicide to said compound is from 100:1 to 1:5.

10. In the method of controlling weed growth in cultivated plants through the application of a herbicide, the improvement which comprises applying to the cultivated plants, their seeds or seedlings, or to the environs of their growth an amount of a compound of a formula:



wherein

each of R_1 and R_3 independently of the other is chloro, bromo or fluoro;

each R independently is hydrogen, methyl, chloro, bromo, fluoro, methoxy, nitro, hydroxy, trifluoromethyl, ethynyl, amino, acetamido, carboxy, carbomethoxy or acetamidosulfonyl; and

n is 1 or 2,

which amount is sufficient to protect said cultivated plants from the action of said herbicide.

4,493,727

PLANT GROWTH REGULATING METHOD

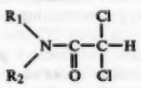
István Tóth, Sajóbábony; József Nagy, Miskolc; Zsolt Dombay, Miskolc; Erzsebet Grega née Tóth, Miskolc; Ibolya Horváth, Szeged; László Vigh, Szeged, and Tibor Farkas, Szeged, all of Hungary, assignors to Északmagyarországi Vegyimüvek, Sajóbábony, Hungary

Filed Nov. 3, 1982, Ser. No. 438,746

Int. Cl.³ A01N *37/18, 43/46*

U.S. Cl. 71—088 **11 Claims**

1. A method of stimulating the growth and green weight of millet or sorghum plants growing upon a plant site, comprising applying to said site 0.1 to 4.0 kg/ha of a compound of formula (I)



(I)

wherein

R_1 and R_2 are identical or different and each is hydrogen, a C_{1-4} straight or branched alkyl group, cyclohexyl, phenyl, chlorophenyl, C_1–C_4 alkylphenyl, benzyl or C_1–C_4 alkylbenzyl group, or R_1 and

R_2 together with the N atom form a hexamethyleneimino ring in a composition containing said compound together with a solid or liquid carrier and at least one surface-active agent.

4,493,728

PLANT GROWTH INHIBITING OXAZOLYL-SUBSTITUTED TRIAZINONE AND OXADIAZINONE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE

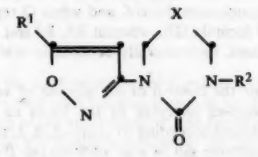
Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1983, Ser. No. 507,874

Int. Cl.³ A01N *43/64, 43/88;* C07D *413/04*

U.S. Cl. 71—92 **7 Claims**

1. A compound of the formula



(I)

wherein R^1 contains from three to five carbon atoms and is one of alkyl, alkenyl, alkynyl, alkoxyalkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cycloalkyl, and alkylcycloalkyl, R^2 is alkyl, alkoxy, (mono- or polyhalo)alkyl of from one to three carbon atoms, cycloalkyl of from three to six carbon atoms, or alkenyl of from three to five carbon atoms, and X is —O— or

wherein R^3 is alkyl of from one to three carbon atoms, cyclopropyl or 1-methylcyclopropyl.

4,493,729

N-PHENYLCARBAMOYL-PYRIDINE COMPOUNDS

Francois de Reinach Hirtzbach, Lyons, and Dominique Ambrosi, Charbonnieres les Bains, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

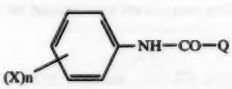
Filed Jul. 14, 1981, Ser. No. 283,136

Claims priority, application France, Jul. 16, 1980, 80 15993; Jul. 16, 1980, 80 15994

Int. Cl.³ C07D *211/90, 213, 56;* A01N *43/40*

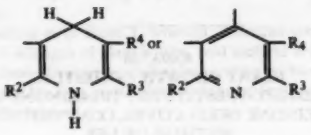
U.S. Cl. 71—94 **15 Claims**

1. N-phenylcarbamoyl pyridine derivatives of the general formula:



(I)

wherein X represents a halogen atom or a lower alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, lower alkyl substituted by one or more halogen atoms, nitro or an amino group unsubstituted or substituted by one or two lower alkyl groups, which may be the same or different, or by a group —CO—R^1 (wherein R^1 represents a lower alkyl, lower alkoxy, mono(lower)alkylamino group or di(lower)alkylamino group wherein the lower alkyl groups may be the same or different), n represents an integer from 1 to 5 inclusive, it being understood that when n represents an integer from 2 to 5 inclusive, atoms or groups represented by X may be the same or different, and Q represents a group of the general formula:



(IIA) (IIB)

wherein R^2 and R^3 may be the same or different and each represents a hydrogen atom or a lower alkyl group, and R^4 represents a group —COR^5, wherein R^5 represents a hydroxy or OR^6 group, wherein R^6 represents a lower alkyl group and, when R^5 represents a hydroxy group, agriculturally-acceptable inorganic and organic salts thereof, and when Q represents a group of general formula IIB, wherein R^2, R^3 and R^4 are as hereinbefore defined, agriculturally acceptable acid addition salts thereof.

7. A method for the control of the growth of weeds at a locus which comprises applying to the locus an effective amount of a compound according to claims 1, 2, 3, or 4, or an agriculturally acceptable salt or acid addition salt thereof.

4,493,730

PHENOXYPYRIDINE USEFUL AS A HERBICIDE

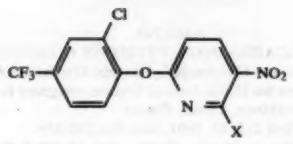
Fumio Kimura, and Takahiro Haga, both of Shiga, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Sep. 10, 1982, Ser. No. 416,744

Int. Cl.³ A01N *43/40*; C07D *213/61, 213/64*

U.S. Cl. 71—94 **14 Claims**

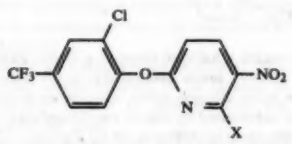
1. A phenoxypyridine compound represented by the formula (I):



(I)

wherein X represets hydrogen atom, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, amino group, cyano group, hydroxy group, fluorine atom, chlorine atom, bromine atom, iodine atom, or 2-chloro-4-trifluoromethylphenoxy group.

8. A herbicidal composition comprising an effective amount of a phenoxypyridine compound represented by the formula (I):



(I)

wherein X represents hydrogen atom, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, amino group, cyano group, hydroxy group, fluorine atom, chlorine atom, bromine atom, iodine atom, or 2-chloro-4-trifluoromethylphenoxy group, as an active ingredient and an agriculturally acceptable adjuvant.

4,493,731

HERBICIDAL AGENTS

Gerhard Hörlein, Frankfurt am Main; Hubert Schönowsky, Rödermark; Hermann Bieringer, Eppstein, and Peter Langelüddeke, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

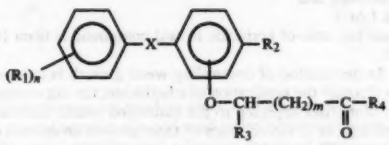
Continuation of Ser. No. 941,921, Sep. 13, 1978, abandoned, which is a division of Ser. No. 816,700, Jul. 18, 1977, Pat. No. 4,134,753. This application Sep. 16, 1980, Ser. No. 187,791

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632581

Int. Cl.³ A01N *37/18*; C07C *103/22*

U.S. Cl. 71—118 **21 Claims**

1. A compound of the formula



in which R_1 is halogen, (C_1–C_4)-alkyl, NO_2 or CN, R_2 is NO_2, CN or CF_3, n is 1 to 3, m is zero to 2, X is O or S, R_3 is (C_1–C_4)-alkyl and R_4 is amino, hydrazino, (C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino or phenylamino in which phenyl may be substituted by halogen, CF_3, CH_3, OH and/or (C_1–C_2)-alkoxycarbonyl.

4,493,732

METHOD FOR IMPLEMENTING PYRO-METALLURGICAL PROCESSES

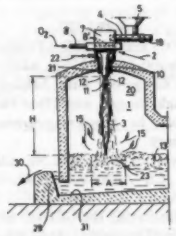
Gerhard Melcher, Cologne, and Wolfgang Wuth, Berlin, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,021

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212100

Int. Cl.³ C22B *5/12*

U.S. Cl. 75—24 **6 Claims**



1. A single step method for the pyrometallurgical treatment of finely divided particles of sulfidic and/or oxidic ore or concentrates with an oxygen-containing reactive gas which comprises:

mixing said particles and said reactive gas in substantially stoichiometric proportions under superatmospheric pressure in a mixing zone to form a pressurized suspension,

passing said pressurized suspension through an acceleration nozzle at a confined molten bath,

surrounding said suspension with an annular flame as it issues from said acceleration nozzle to spontaneously ignite said suspension and form a concentrated particle stream having an angle of spread not more than about 16°, and

generating sufficient energy in said particle stream to induce convective currents in the molten bath where it is impacted by said particle stream.

4,493,733

CORROSION-RESISTANT NON-MAGNETIC STEEL RETAINING RING FOR A GENERATOR

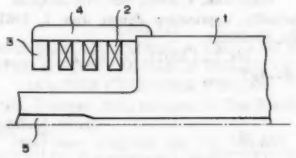
Masao Yamamoto, Tokyo; Takashi Yebisuya, Kawasaki; Mituo Kawai, and Koichi Tajima, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 359,245, Mar. 18, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,236

Claims priority, application Japan, Mar. 20, 1981, 56-39478; Mar. 20, 1981, 56-39481

Int. Cl.³ C22C *38/58*

U.S. Cl. 75—126 B **6 Claims**



1. A non-magnetic, crevice corrosion resistant steel retaining ring for a generator consisting essentially of, in terms of weight percentage, 0.4% or less of carbon, above 0.3% but up to 1% of nitrogen, 2% or less of silicon, 12 to 20% of chromium, 13 to 25% of manganese, the balance consisting substantially of iron, the total content of the chromium and manganese being at least 30%, said retaining ring manufactured by cold working and having a magnetic permeability less than 1.1.

4,493,734

CONDITIONING OF CRUDE PIGMENT IN A SALT FREE CORN SYRUP BASED MEDIUM

Thomas R. Flatt, Ridgewood, N.J., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 23, 1983, Ser. No. 497,379

Int. Cl.³ C09C *1/00, 3/00*; C09B *1/00*

U.S. Cl. 106—309 **14 Claims**

1. In a process for conditioning a crude pigment by subjecting it to shear the improvement which comprises conditioning it in the presence of an agent selected from the group consisting of corn syrup, corn syrup solids and molasses in a high shear mixing device in the absence of any solid grinding aid.

4,493,735

DEVICE AND METHOD FOR FORMING A FLUIDIZED BED

Erwin Flaschel, Chavannes-Renens, and Albert Renken, St-Sulpice, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 12, 1982, Ser. No. 397,434

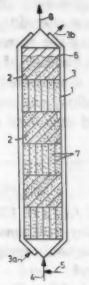
Claims priority, application Switzerland, Jul. 17, 1981, 4707/81

Int. Cl.³ B01J *8/20, 8/34*

U.S. Cl. 134—25.1 **7 Claims**

1. A method of forming a fluidized bed of solid particles in a reactor having superposed static mixing elements, each element with parallel flow channels extending at an angle to a longitudinal direction of the reactor and with successive mixing elements being rotated through an angle around the reactor therein, said method comprising the steps of

introducing an amount of solid particles and feeding continuously at least one flowable medium into the reactor at a rate sufficient to form a stable fluidized bed of the solid particles and flowable medium within the static mixing elements;



passing the solid particles and flowable medium through the superposed static mixing elements to obtain a transverse mixing of the solid particles and flowable medium; and

taking off the flowable medium at the top of the reactor.

4,493,736

TARNISH-RESISTANT COPPER ALLOY AND METHOD OF PREPARATION

William R. Adams, Hampden, Mass., assignor to Trindium Corporation of America, Sauquoit, N.Y.

Filed Oct. 5, 1983, Ser. No. 538,806

Int. Cl.³ C22C *9/01*; C22F *1/08*

U.S. Cl. 148—2 **2 Claims**

1. An alloy which consists essentially of

(a) from about 9 to about 11 percent by weight of aluminum;

(b) from about 0.75 to about 1.25 percent by weight of nickel;

(c) from about 0.01 to about 0.1 percent by weight of indium; and

(d) from about 87.65 to about 90.24 percent by weight of copper.

2. A method of alloying copper, aluminum, nickel and indium to enhance the tarnish-resistance of the alloy, which comprises;

(1) providing a melt of the nickel and a portion of the copper;

(2) adding the aluminum and indium to the molten mixture of copper and nickel, said aluminum being in the form of an alloy with the remainder of the copper;

(3) thoroughly melting the mixture of (2) above;

(4) cooling the melt (3) to solidify an alloy consisting essentially of 9–11 wt.% Al, 0.75–1.25 wt.% Ni, 0.01–0.1 wt.% In and 87.64–90.24 wt.% Cu; and

(5) hot-rolling the solid to reduce its thickness to from 1/7 to 1/18 of its original thickness.

4,493,737

METHOD FOR FABRICATING URANIUM ALLOY ARTICLES WITHOUT SHAPE MEMORY EFFECTS

John G. Banker, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 21, 1980, Ser. No. 151,849

Int. Cl.³ C22F *1/18*

U.S. Cl. 148—11.5 R **3 Claims**

1. A method for fabricating a configured article of uranium alloy consisting essentially of uranium, 5 to 23 wt.% niobium, and 0 to 10 wt.% zirconium by plastic deformation so as to obviate the shape memory effects characteristic of the alloy when the configured article is subsequently heated to a temperature greater than about 100° C., said method comprising the

steps of heating the alloy in an inert atmosphere to a temperature above the gamma transformation temperature of the alloy, quickly forming the heating alloy into a desired article configuration with matched dies each maintained at a temperature substantially below the martensitic transformation temperature of the alloy, completing the formation of the alloy into said configuration prior to cooling of the alloy to a temperature below which the alloy is subjected to an alpha phase transformation, cooling said alloy, and maintaining the alloy in said configuration with said dies until said alloy cools to ambient temperature.

4,493,738

BRAZING ALLOY COMPOSITION

Owen N. Collier, Henley-on-Thames, and Gordon L. Selman, Reading, both of England, assignors to Johnson Matthey PLC, London, England

Continuation-in-part of Ser. No. 261,378, May 7, 1981, abandoned, which is a continuation of Ser. No. 102,160, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 940,456, Sep. 7, 1978, abandoned. This application Feb. 28, 1983, Ser. No. 470,545

Claims priority, application United Kingdom, Sep. 16, 1977, 7738738

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—24 **6 Claims**

1. A brazing alloy composition which is in the solid phase at room temperatures comprising 50–95% by weight of a particulate brazing alloy, balance a flux and a thermoplastic material, wherein the flux contains a reactive component selected from the group consisting of the fluoroborates, the silicofluorides and the aluminofluorides and wherein the thermoplastic material comprises a petroleum wax which melts in the approximate temperature range 50° C. to 125° C.

4,493,739

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET OR STRIP HAVING A LOW WATT LOSS AND A GRAIN-ORIENTED ELECTROMAGNETIC STEEL STRIP HAVING UNIFORM MAGNETIC PROPERTIES

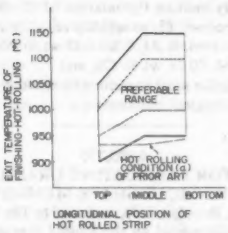
Koichi Fujiwara; Tomohiko Sakai; Yoneo Yamada, and Kazutaka Higashine, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,107

Claims priority, application Japan, Aug. 5, 1981, 56-121862

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—111 **6 Claims**



1. A process for producing a grain-oriented electromagnetic steel sheet or strip having a low watt loss, wherein:

a silicon steel slab containing not more than 0.085% by weight of carbon, from 2.0% to 4.0% by weight of silicon, from 0.030% to 0.090% by weight of manganese, and from 0.010% to 0.060% by weight of sulfur, the balance being essentially iron and unavoidable impurities, is hot-rolled, cold-rolled and final-annealed, wherein

final cold-rolling is carried out at a reduction ratio of from 50% to 80%;

said silicon steel slab additionally contains from 0.02% to 0.2% by weight of copper;

the exit temperature of the finishing-hot-rolling step is controlled so that the size of Cu_2S particles formed by said copper and said sulfur is uniform along the full length of a hot-rolled strip; and

temperature of the top portion of the hot-rolled strip is in the range of from 900° C. to 1050° C., and temperature of the middle and bottom portions thereof is in the range of from 950° C. to 1150° C.

4,493,740

METHOD FOR FORMATION OF ISOLATION OXIDE REGIONS IN SEMICONDUCTOR SUBSTRATES

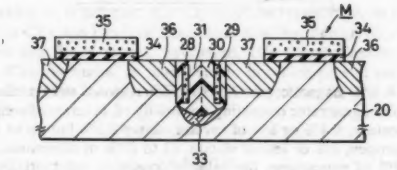
Tadao Komeda, Ikoma, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Jun. 1, 1982, Ser. No. 384,030

Claims priority, application Japan, Jun. 1, 1981, 56-84693; Apr. 8, 1982, 57-58833

Int. Cl.³ H01L *21/265, 21/76*

U.S. Cl. 148—187 **18 Claims**



1. In a method for the formation of isolation oxide regions in a semiconductor substrate, the improvement comprising:

(a) forming an oxidation-inhibiting film on one surface of a semiconductor substrate of one conductivity type;

(b) removing selected areas of said oxidation-inhibiting film through an etching mask in said semiconductor substrate in portions beneath the selected areas to a given depth, thereby forming recesses in said semiconductor substrate;

(c) forming a thin layer of a semiconductor material capable of being oxidized into a corresponding growing oxide over the one surface of the semiconductor substrate;

(d) removing the thin layer of the semiconductive material from the semiconductor substrate while leaving thin layers of the semiconductive material only on side surfaces of each recess so that a central portion of the bottom of each recess is exposed; and

(e) subjecting the thin layers to oxidation for converting the semiconductive material into the corresponding oxide until the recesses are each completely filled with the oxide whereby dielectric isolation regions are formed in the respective recesses.

4,493,741

AMINE SALTS AS BONDING AGENTS

Marjorie E. Ducote, Huntsville, and Henry C. Allen, Decatur, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1983, Ser. No. 488,249

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.4 **10 Claims**

1. In a solid propellant composition employing a high solids loading of an inorganic oxidizer and aluminum metal fuel and a binder system comprised of hydroxy-terminated polybutadiene, a plasticizing agent, a polyisocyanate curing agent, and a bonding agent, the improvement achieved from preventing in situ ammonia generation during the mixing and curing cycles

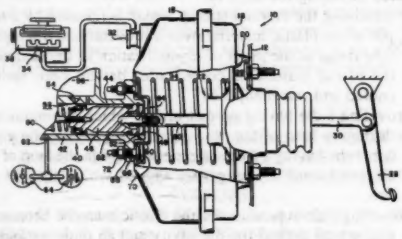
of said propellant composition by employing as said agent a polyamine salt adduct bonding agent wherein said polyamine salt adduct bonding agent functions to minimize in situ ammonia formation, to decrease mixing time for propellant processing, and to increase reproducibility of the mechanical properties in the cured propellant, said polyamine salt adduct bonding agent being an adduct of an ammonium salt selected from the group consisting of ammonia perchlorate, ammonium nitrate, ammonium sulfate, and ammonium formate, and a polyamine compound selected from the group consisting of cyanoethyl substituted tetraethylene pentamine, and the glycidol reaction product of cyanoethyl substituted tetraethylene pentamine, said polyamine salt adduct bonding agent further defined as being the reaction product formed from reacting together said ammonium salt and said polyamine compound in a reaction to produce said polyamine salt adduct bonding agent as a recovered product having from about 25 to about 36 percent of the reactive amine groups of said polyamine compound reacted with the ammonium ion of said ammonium salt.

4,493,742

METHOD FOR ADJUSTING A VACUUM BRAKE BOOSTER OUTPUT MEMBER RELATIVE TO A MASTER CYLINDER PISTON

James B. Putt, Granger, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 23, 1984, Ser. No. 592,652
Int. Cl.³ B32B 7/04
U.S. Cl. 156—91 **7 Claims**



1. A method for adjusting a vacuum brake booster output member relatve to a master cylinder piston member comprising the steps of providing a plunger disposed between the members, the plunger cooperating with one of the members to define a cavity, disposing a bonding material in the cavity before the master cylinder is coupled to the vacuum brake booster, the plunger substantially defining a passage leading to the bonding material, disposing the members adjacent each other to adjust the position of the plunger in the cavity and communicate an excess amount of bonding material outwardly of the cavity via the passage, and holding the members in a desired adjusted position until the bonding material sets and fixes the plunger to the one member in its adjusted position so that the plunger also engages the other member to form a rigid link between the members.

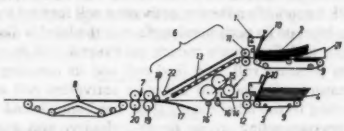
4,493,743

SHEET LAMINATING MACHINE

Thorkild Lunding, Dannike, Sweden, assignor to Kinds Industri AB, Atvidaberg, Sweden

PCT No. PCT/SE82/00146, § 371 Date Jan. 3, 1983, § 102(e) Date Jan. 3, 1983, PCT Pub. No. WO82/03822, PCT Pub. Date Nov. 11, 1982
PCT Filed May 3, 1982, Ser. No. 459,646
Claims priority, application Sweden, May 4, 1981, 8102774
Int. Cl.³ B32B 31/00
U.S. Cl. 156—555 **7 Claims**

1. A sheet laminating machine for uniting two or several sheets in aligned and superposed relationship to form a multiply sheet, said machine comprising an upper sheet-deposit unit for feeding and positioning the top sheet or sheets, a lower sheet-deposit unit for feeding and positioning the bottom sheet, means designed to apply glue to the upper face of the bottom sheet, means for registering the sheets, presser means and a discharge unit, said registering means consists of an upper registering plate which is designed to guide the top sheets from



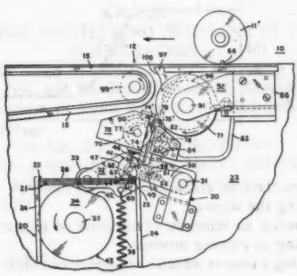
the upper sheet-deposit unit up to the plane of advancement of the bottom sheets, and of a lower registering plate which is designed to guide the lower sheets in underneath a registering roller, characterized in that said roller resting, in its starting position, on the lower registering plate and being mounted on a shaft with some play, said shaft extending transversely of the plane of advancement of the sheets and being mounted so as to be vertically movable.

4,493,744

LABELING MACHINES

Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and John D. Spano, Hasbrouck Heights, all of N.J., assignors to NJM, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 382,940, May 28, 1982,. This application May 25, 1983, Ser. No. 498,138
Int. Cl.³ B65C 9/08
U.S. Cl. 156—568 **5 Claims**



1. In a labeling machine, a hopper for carrying a stack of labels, a label applying station, and means for successively and positively feeding labels from said hopper to said applying station comprising:

a rotatable turret provided with suction means located adjacent to the leading edge of the terminal label in said hopper and adapted to lift by vacuum such leading label edge out of said hopper and then to mechanically withdraw such label from said hopper;

means for reciprocating said turret in displacement from an opening in said hopper, said reciprocating means including a cam and a cam-follower arm carring said turret, said cam follower arm being operatively driven by said cam during a rotation of said cam, the radius of said cam varying to provide for reciprocating motion of said turret relative to an end portion of said stack of labels, thereby to provide for engagement of said turret periodically with a new label;

a first guide means defining a given path of travel for the label, a first pressure roll cooperating with said turret to mechanically draw such label from the hopper and to

advance the leading edge thereof into the entry end of said first guide means, said turret being constructed of varying radius to provide for a periodic variation in pressure provided against said label by said first pressure roll;

a rotatable feed roll and a second pressure roll located to coactively engage the label intermediate the ends of its given path through said first guide means and prior to the release of the label by said turret and said first pressure roll, a rotatable adhesive activation roll located to receive the label on its peripheral surface as the label is discharged from said first guide means, said turret and its coacting first pressure roll, said feed roll and its coacting second pressure roll, and said adhesive activation roll each imparting to the label during their mechanical feed thereof, a corresponding given linear velocity, and means for transferring the label from said glue activation roll to said applying station without substantially diminishing such given linear velocity thereof; and wherein

said adhesive activation roll is void of glue, and wherein said labels are coated with an adhesive.

4,493,745

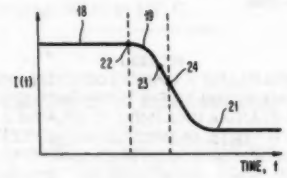
OPTICAL EMISSION SPECTROSCOPY END POINT DETECTION IN PLASMA ETCHING

Lee Chen, Poughkeepsie; Henri A. Khoury, Yorktown Heights, both of N.Y., and Harlan R. Seymour, Morton Grove, Ill., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,611

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—626 **7 Claims**



1. A method of etching a layer of material to end point, comprising the steps of:

monitoring an intensity of emission of a species produced during an etching process;

detecting a time at which a change in such intensity of emission occurs;

calculating a time period extending in length from the time of said change to end point; and

terminating the etching process at the conclusion of said time period, whereby said layer of material is etched to end point.

4,493,746

METHOD FOR REDUCTION OF OXIDES AND IMPROVING POROSITY OF METALIZED ZIRCONIUM OXIDE CERAMICS

Larry T. Reed, Richardson, Tex., assignor to Axia Incorporated, Oak Brook, Ill.

Filed Mar. 23, 1984, Ser. No. 592,624

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—644 **16 Claims**

1. A method for increasing the porosity of thick film deposited sintered metallic coatings comprising:

(a) placing a part which has a sintered metallic coating in an acid solution;

(b) heating said solution to a temperature below its boiling point; and

(c) maintaining said part in said heated solution for a period of time sufficient to increase the porosity of the metallized coating to a predetermined amount.

4,493,747

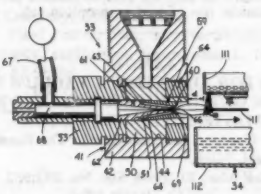
METHOD FOR INSULATING CONDUCTORS WITH A CRYSTALLINE PLASTIC MATERIAL

William M. Kanotz, Baldwin; William C. Vesperman, Bel Air, and Max K. Wilson, Cockeysville, all of Md., assignors to AT&T Technologies, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 342,990, Jan. 27, 1982, abandoned. This application Sep. 2, 1983, Ser. No. 528,667

Int. Cl.³ B32B *31/14*

U.S. Cl. 156—64 **10 Claims**



1. A method of extruding a crystalline plastic material, said method including the steps of:

determining the thermal energy which is released by a sample of the plastic material over a predetermined temperature range at the onset of crystallization as the sample of the plastic material is cooled after having been melted, cooled and remelted; then

providing a die having an exit orifice which communicates through a land of the die with a cavity of the die and a core tube having a free end recessed within the land of the die and having a passageway aligned within the die orifice;

providing a flow passage for the plastic material between a wall which defines the die cavity and an outer surface of the core tube, said flow passage converging to the die land and being configured in accordance with the relative value of the thermal energy which is released by the plastic material at the onset of crystallization;

advancing a conductor along a path through the passageway of the core tube and the die orifice;

flowing the plastic material along the flow passage and through the die orifice; and

controlling the step of advancing the conductor to control the drawdown of the plastic material on the conductor.

4,493,748

PROCESS OF MAKING RAISED LINE IMPRINTED DISPLAY MOUNTS

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed Jan. 6, 1984, Ser. No. 568,814

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—79 **8 Claims**

1. A process of making raised line imprinted display mounts comprising the steps of:

selecting a foam polymer sheet having a thin polymer laminate covering; and

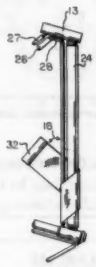
heat stamping the laminate covering surface of said foam polymer sheet with a heated die surface under a predetermined pressure and at a predetermined temperature to produce a raised surface stamping of the heated die surface on the laminate covering.

4,493,749

COMPOSITE VEHICLE FRAMES AND METHOD OF MANUFACTURING COMPOSITE VEHICLE FRAMES

David C. Brezina, 2035 W. Berwyn Ave., Chicago, Ill. 60625

Filed Sep. 30, 1982, Ser. No. 428,596
Int. Cl.³ B62K 3/04
U.S. Cl. 156—187 3 Claims



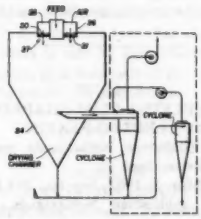
1. A method of constructing structural frameworks in which a rigid tubular sub-frame comprising a series of round cross-section tubes, in which the structural elements are comprised of a multiplicity of tubes, the main structural members comprising at least two parallel tubes of differing diameter, and the secondary structural members comprising at least two nearly parallel tubes, wherein said sub-frame provides for the application of resin impregnated fiber sheet by wrapping said sheet around the tubular, members of said subframe at an angle of less than 90° relative to the axis of said tubular member.

4,493,750

THERMODYNAMIC CONDITIONING OF AIR OR ANY OTHER GAS TO INCREASE THE OPERATING EFFICIENCY OF DIVERSE ENERGY CONSUMING SYSTEMS

James F. Olmsted, 4620 26th St., N., Arlington, Va. 22207; Sherwood F. Webster, 7832 Via Marina, Scottsdale, Ariz. 85258, and Richard L. Heise, 133 E. Garfield, Tempe, Ariz. 85281

Filed Jul. 16, 1982, Ser. No. 398,977
Int. Cl.³ B01D 1/14, 3/06; F24C 9/00; F26B 3/02
U.S. Cl. 159—48.1 11 Claims



1. A method of treating gas for use in diverse energy consuming systems to improve the efficiency of such systems and reduce energy consumption and air pollution, comprising the steps of causing a moving stream of gas possessing kinetic energy to impinge against the upstream side of a foraminous barrier having a multitute of dis-similar adjacent nozzle orifices and thereby convert its kinetic energy substantially into internal energy within the gas, then compressing the gas through said nozzle orifices of the foraminous barrier to further increase its internal energy and to reduce the pressure of the gas at the time of downstream adiabatic expansion of the gas and substantially increasing both its intensity of turbulence and scale of turbulence in a space downstream of the foraminous barrier, where the gas is enabled to mix in such space with another substance therein and to very rapidly transfer unusually high latent heat to said substance so as to vaporize, dry or oxidize it at unusually low temperature, the foraminous barrier consisting of a single pair of screen sections arranged in face-to-face contact with their interstices and apertures randomly arranged to form said multitude of dis-similar adjacent nozzle orifices, and the upstream screen section being of a coarser mesh than the downstream screen section in the approximate mesh number ratio of 0.375:1.

4,493,751

POLYOXYMETHYLENE FIBRIDS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Harald Cherdron, Wiesbaden; Wolfgang Gordon, Hofheim am Taunus, and Friedrich Kloos, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 209,015, Nov. 21, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,154
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947490
Int. Cl.³ D21H 5/12
U.S. Cl. 162—157.2 6 Claims

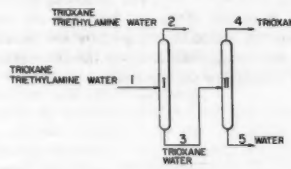
1. Highly branched polyoxymethylene fibrids with a reduced specific viscosity of 0.4 to 2.0 dl/g, a specific surface area of 50 to 200 m^2/g, said specific surface area being measured at 140° C. in butyrolactone, which contains 2% by weight of diphenylamine, in a concentration of 0.5 g/100 ml, a freeness of 30° to 80° SR, a length of about 0.1 mm to 5 mm and an apparent diameter of about 1 to 200 μm.

4,493,752

PROCESS FOR RECOVERING TRIOXANE BY PLURAL DISTILLATION

Takeshi Naito; Junzo Masamoto, both of Kurashiki; Toshiyuki Iwaisako, Fuji, and Kazuhiko Matsuzaki, Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,461
Claims priority, application Japan, Apr. 27, 1981, 56-62406
Int. Cl.³ B01D 3/14; C07D 323/06
U.S. Cl. 203—71 6 Claims



1. A process for recovering trioxane from an aqueous solution containing trioxane and triethylamine by distillation which comprises feeding an aqueous solution containing trioxane and triethylamine to a first distillation column of a distillation apparatus comprising a first and a second distillation column, distilling out triethylamine, trioxane and water as an overhead from the first distillation column, withdrawing an aqueous solution containing the major part of the trioxane present in the feed solution from the bottom of the first distillation column, feeding the withdrawn solution to the second distillation column and taking out substantially the whole quantity of the trioxane fed to the second distillation column from the overhead of the second distillation column and withdrawing water from the bottom thereof.

4,493,753

METHOD FOR PRODUCING SEPARATING NOZZLE ELEMENTS FOR THE SEPARATION OF FLUID MIXTURES

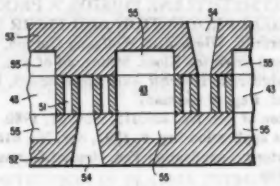
Erwin Becker; Wolfgang Ehrfeld, both of Karlsruhe; Dietrich Münchmeyer, Weingarten; Hans Betz, and Anton Heuberger, both of Munich, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 502,721

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3221981

Int. Cl.³ C25D *1/02, 1/20*

U.S. Cl. 204—9 11 Claims



1. A method for producing a separating nozzle element composed of a separating body and two cover plates between which the body is interposed, the separation nozzle element being used for the separation of gaseous or vaporous mixtures, comprising:

providing a layer of a material whose ability to be removed from the layer can be altered by irradiation with radiation of a selected type, the thickness of the layer being approximately equal to the thickness of the separating body;

irradiating the layer, starting at one surface, with radiation which is of the selected type and which has a penetration depth into the material of the layer which is less than thickness of the layer, in a pattern corresponding to the cross-section of the separating body;

removing from the layer material which is more easily removable as a result of said irradiation to form a mold of the separating body; and

filling the mold with structure material which is compatible with the mixtures to be separated and removing the material constituting the mold to create the separating body;

wherein said irradiation and said removal of material which is more easily removable comprise removing material at successively increasing distances from the one surface while causing the radiation to penetrate the material at successively increasing distances from the one surface as a result of the removal of the material.

4,493,754

ELECTRODES FOR PALLADIUM ELECTROPLATING PROCESS

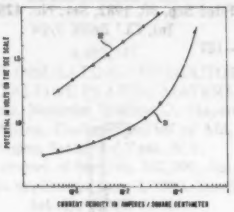
Joseph A. Abys, Bridgewater, and Yutaka Okinaka, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,348

Int. Cl.³ C25D *3/52*

U.S. Cl. 204—47 8 Claims

1. A process for electroplating palladium comprising the step of passing current through an anode, plating solution and cathode, said plating solution comprising a source of palladium and complexing agent said complexing agent consisting essentially of at least one aliphatic polyamine with up to 20 carbon



atoms characterized in that the surface of the anode comprises 8 ferrite.

4,493,755

ELECTROLYTIC PREPARATION OF ORTHOALKYL-2-HALO-N-ACYLANILIDES

Richard D. Goodin, St. Louis, and John P. Chupp, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 7, 1983, Ser. No. 530,135

Int. Cl.³ C25B *3/00*

U.S. Cl. 204—73 R 21 Claims

1. The process of producing orthoalkyl N-acylanilides which comprises electrolyzing an sulfonium salt at the cathode in an electrolysis medium at a cathode potential sufficiently negative and under conditions to effect reduction of the sulfonium salt and production of an ortho-alkyl-N-acylanilide.

4,493,756

PROCESS FOR CLEANING METAL FILTERS

Peter J. Degen, Huntington, and Thomas C. Gsell, Sea Cliff, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jun. 21, 1983, Ser. No. 506,364

Int. Cl.³ C25F *1/00, 1/06*

U.S. Cl. 204—141.5 26 Claims

1. A process for cleaning a porous metal filter comprising electrolyzing said filter in an electrolytic system subjected to an imposed or applied current using said filter as an electrode of said system, and rinsing said filter to remove electrolyte and to flush any residual contaminants from said filter.

4,493,757

DEVICE FOR APPLYING BLOT-SHAPED COVERINGS BY ELECTRO-PLATING

Harry C. Piepers, Eindhoven, Netherlands, assignor to Galentan, A.G., Zug, Switzerland

Filed Mar. 1, 1982, Ser. No. 353,151

Claims priority, application Netherlands, Mar. 7, 1981, 8101106

Int. Cl.³ C25D *17/06*

U.S. Cl. 204—206 15 Claims

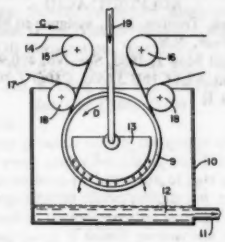
1. A device for applying blot-shaped coverings to a metal or metallized tapes by electro-plating, comprising:

a guide member along which a metal and/or metallized tape can be guided;

an endless masking member co-operating with the tape and the guide member and having passages, the shapes of which match the desired blot-shaped coverings, said masking member being formed by independent segments, each of which having at least one passage;

sealing means being arranged between said segments, and

the structure of said sealing means being such that while maintaining the sealing relationship between said segments, said segments move relative to one another in the direction of length of said masking member; and wherein said masking members form a periphery of a wheel.



4,493,758

ANODE STRUCTURE FOR A PLATING CELL

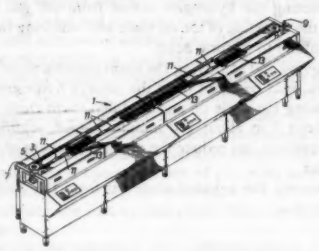
Byran Murrin, Kilmacolm, Scotland; Robert Willis, Godalming, and Jeffrey Page, Woking, both of England, assignors to OMI International Corporation, Warren, Mich.

Filed Nov. 1, 1983, Ser. No. 547,598

Claims priority, application United Kingdom, Nov. 1, 1982, 8231144; Nov. 1, 1982, 8231145; May 11, 1983, 8312912

Int. Cl.³ C25D *17/00, 17/12*

U.S. Cl. 204—224 R **6 Claims**



1. An anode assembly suitable for a plating cell, the assembly comprising a pair of anode structures, each anode structure having a support and at least two thin elongate electrically conducting members in side by side relationship held by the support and wherein, in at least part of the assembly, the anode structures are not parallel to each other.

4,493,759

ELECTROLYTIC CELL

Thomas W. Boulton, and Brian J. Derwent, both of Frodsham, England, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

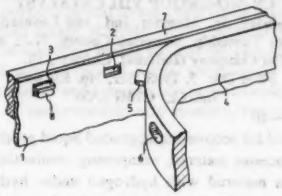
Filed May 16, 1983, Ser. No. 494,887

Claims priority, application United Kingdom, May 19, 1982, 8214532

Int. Cl.³ C25B *9/02, 11/02, 13/02*

U.S. Cl. 204—252 **21 Claims**

1. An electrolytic cell comprising at least one anode and at least one cathode, a separator positioned between an anode and adjacent cathode and dividing the cell into separate anode and cathode compartments, and at least one gasket of an electrically insulating material positioned between adjacent anodes and cathodes, characterized in that the gasket has a plurality of projections and recesses on or in a surface thereof adapted to co-operate with corresponding recesses and projections in or on a surface of an anode and/or of a cathode adjacent thereto.



4,493,760

ELECTROLYTIC CELL HAVING NONPOROUS PARTITION

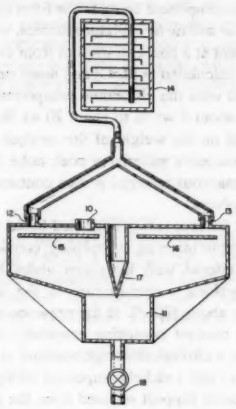
Giuseppe Bianchi, Milan, Italy, assignor to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Dec. 7, 1983, Ser. No. 559,025

Claims priority, application Italy, Dec. 23, 1982, 24931 A/82

Int. Cl.³ C25B *13/02, 1/26*

U.S. Cl. 204—278 **7 Claims**



1. An electrolytic cell for the production of chlorine gas by the electrolysis of a sodium chloride solution, particularly for the formation of chlorine water in a washing machine or a dishwasher, said cell comprising:

a cell body including therein a cathode compartment having a cathode electrode for the formation of hydrogen gas during electrolysis and an anode compartment having an anode electrode for the formation of chlorine gas during electrolysis;

means for charging sodium chloride solution into said compartments;

means for discharging hydrogen and chlorine gas from said compartments;

means for discharging from sid compartments solutions resulting from electrolysis;

means for providing physical and electrolytic communication between the bottoms of said compartments while preventing physical and elecrolytic communication above said bottoms, said providing and preventing means comprising a nonporous partition; and

said electrodes extending in generally horizontal planes in the respective said compartments at levels above a lower end of said partition.

4,493,761
CATALYTIC HYDROLIQUEFACTION USING A CR-MO-GROUP VIII CATALYST

Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Bridgewater Township, Somerset County, N.J., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 5, 1983, Ser. No. 558,093
Int. Cl.³ C10G *1/08*
U.S. Cl. 208—10 **19 Claims**

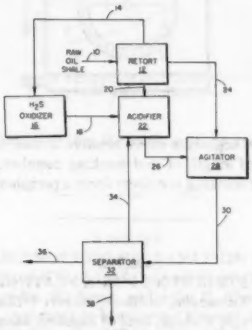
1. A method for recovering upgraded liquid products from a solid carbonaceous material, comprising: contacting the solid carbonaceous material with hydrogen under hydrogenation conditions comprising a temperature in the range of from about 300° C. to about 500° C. in the presence of a hydrocarbon conversion catalyst consisting essentially of a molybdenum component and a chromium component on a porous refractory inorganic oxide support selected from the group consisting of alumina, silica, silica-alumina, stabilized alumina, phosphated alumina, stabilized phosphated alumina, fluorided alumina, alumina-aluminum phosphate, boria-alumina, magnesia-alumina, boria and magnesia, and having a surface area of from about 150 m^2/gm to about 300 m^2/gm, a total pore volume, as determined by nitrogen desorption measurement, of from about 0.4 cc/gm to about 0.8 cc/gm, with an average pore diameter of from about 100 Å to about 200 Å, with each metal component being in the form of the elemental metal, its oxide or sulfide or a mixture thereof, with the molybdenum component at a concentration of from about 3 wt % to about 30 wt %, calculated as MoO_3 and based on the weight of the catalyst, and with the chromium component at a concentration of from about 2 wt % to about 20 wt %, calculated as Cr_2O_3 and based on the weight of the catalyst, and wherein, when the carbonaceous material is coal, coke, lignite or biomass, the carbonaceous material is also contacted with a hydrogen-donor solvent.

12. A method for recovering upgraded liquid products from a solid carbonaceous material, comprising: contacting the solid carbonaceous material with hydrogen under hydrogenation conditions comprising a temperature in the range of from about 300° C. to about 500° C. in the presence of a hydrocarbon conversion catalyst consisting essentially of a molybdenum component, a chromium component and at least one of a cobalt component and a nickel component on a porous refractory inorganic oxide support selected from the group consisting of alumina, silica, silica-alumina, stabilized alumina, phosphated alumina, stabilized-phosphated alumina, fluorided alumina, alumina-aluminum phosphate, boria-alumina, magnesia-alumina, boria and magnesia and having a surface area of from about 150 m^2/gm to about 300 m^2/gm, a total pore volume, as determined by nitrogen desorption measurement, of from about 0.4 cc/gm to about 0.8 cc/gm, with an average pore diameter of from about 100 Å to about 200 Å, with each metal component being wherein each of the cobalt component and nickel component that is present is in the form of the elemental metal, its oxide or sulfide or a mixture thereof, with the molybdenum component at a concentration of from about 3 wt % to about 30 wt %, calculated as MoO_3, and based on the weight of the catalyst, with the chromium component at a concentration of from about 2 wt % to about 20 wt %, calculated as Cr_2O_3 and based on the weight of the catalyst, and with each of the cobalt component and nickel component that is present is at a concentration of from about 0.5 wt % to about 10 wt %, calculated as CoO or NiO, respectively, and based on the weight of the catalyst, and wherein, when the carbonaceous material is coal, coke, lignite or biomass, the carbonaceous material is also contacted with a hydrogendonor solvent.

4,493,762
METHOD FOR REDUCING THE NITROGEN CONTENT OF SHALE OIL WITH SPENT OIL SHALE AND SULFURIC ACID

Leslie R. Rudnick, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,905
Int. Cl.³ C10B *53/06*; C10G *1/00*
U.S. Cl. 208—11 R **24 Claims**



1. A method of reducing the nitrogen content of shale oil comprising:

(a) retorting oil shale under oil shale retorting conditions and producing spent shale, hydrogen sulfide containing gas, and a nitrogen containing shale oil therefrom;

(b) extracting the hydrogen sulfide from the gas resulting from the retorting of the oil shale and oxidizing the hydrogen sulfide to sulfuric acid;

(c) removing and acidifying the spent retorted shale with the sulfuric acid resultant from the retort's hydrogen sulfide;

(d) agitating the shale oil and acidified spent shale together for about 5 to about 180 minutes which acidified spent shale extracts and reduce the nitrogen content of the shale oil; and

(e) separating the agitated shale oil from the acidified oil shale.

4,493,763
PRETREATMENT OF OIL-SHALE FOR ENHANCED ARSENIC REMOVAL

Richard P. Rhodes, Westfield, and Frank Hershkowitz, Liberty Corner, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 15, 1983, Ser. No. 513,824
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 R **4 Claims**

1. A method for pretreating oil-shale such that upon subsequent conversion, the resulting oil-shale liquids have substantially less arsenic than if the oil-shale had not been so pretreated, the method comprising subjecting the oil-shale to a temperature from about 250° C. to just below the temperature at which the oil-shale begins to retort, for an effective amount of time and in a reducing environment wherein the reducing agent is selected from hydrogen, carbon monoxide, and mixtures thereof to cause reduction of the oxidation state of the arsenic compounds of the oil-shale.

4,493,764
SEPARATELY SUPPORTED POLYMETALLIC REFORMING CATALYST

Charles T. Kresge, Sewell; Sowmithri Krishnamurthy, Cherry Hill, and William D. McHale, Swedesboro, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 525,778, Aug. 24, 1983,. This application Jun. 8, 1984, Ser. No. 618,791

Int. Cl.³ C10G *35/06*

U.S. Cl. 208—138 5 Claims

1. A reforming process which comprises contacting a reforming charge stock under reforming conditions with a catalyst composition made up of a mixture of two components one component comprising a minor proportion of platinum and rhenium on a carbon dioxide treated support and the second component comprising a minor proportion of iridium and rhenium on a separate carbon dioxide treated support.

4,493,765
SELECTIVE SEPARATION OF HEAVY OIL USING A MIXTURE OF POLAR AND NONPOLAR SOLVENTS

Robert B. Long, Atlantic Highlands, and Fred A. Caruso, Elizabeth, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 6, 1983, Ser. No. 501,197

Int. Cl.³ C01G *21/04, 21/06*

U.S. Cl. 208—309 19 Claims

1. A process for the selective separation of a hydrocarbon feedstock containing low molecular weight polars, saturates, aromatics, and asphaltenes which comprises: (a) contacting the feedstock with a nonpolar solvent having an overall solubility parameter of less than about 8.0 and a polar solvent having an overall solubility parameter greater than about 11.0 in amounts such that the volume average overall solubility parameter for the mixture of polar and nonpolar solvents is between about 9.5 and 10.0, said contacting taking place at, or the resulting mixture being subjected to, a temperature from about 5° to about 20° C. below the critical solution temperature of the mixture so as to form a two-phase mixture consisting of a first extract phase comprising a minor amount of the nonpolar solvent, a major amount of the polar solvent and containing a substantial portion of said low molecular weight polars and a first raffinate phase comprising a minor amount of the polar solvent and a major amount of the nonpolar solvent;

(b) separating the first extract phase from the first raffinate phase;

(c) cooling the separated first raffinate phase by at least about 30° C. to produce a final extract phase comprising the substantial remainder of both the polar solvent and the low molecular weight polars; a final raffinate comprising the nonpolar solvent, saturates, and aromatics; and an asphaltene containing phase; and

(d) separating the final extract phase, the final raffinate phase and the asphaltene-containing phase formed in step (c).

4,493,766
ROTATING SORTER FOR FIBER MATERIAL SUSPENSIONS

Walter Musselmann; Herbert Kinzler, and Josef Trä, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

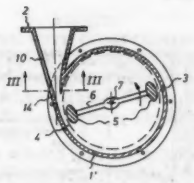
Filed May 24, 1982, Ser. No. 381,242

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121855

Int. Cl.³ B07B *1/20*

U.S. Cl. 209—362 8 Claims

1. A rotating sorter for eliminating minuscule pollutants from fiber material suspensions of the type including a generally vertically disposed fixed housing having a fixed filter basket therein, said generally vertically disposed fixed housing and said fixed filter basket forming therebetween a generally ring-shaped sorting space for receiving fiber material suspensions to be sorted, a rotatable axle member generally vertically disposed in said filter basket and having a plurality of sorter vanes radially extending therefrom to rotate therewith, the remote end portions of said sorter vanes being in close proximity to said filter basket, wherein quality material is sorted into the interior of said filter basket and the delivery of fiber material suspension to be filtered occurs substantially tangentially to said filter basket and substantially perpendicular to the axis of rotation of said rotatable axle member, the improvement comprising:



an inlet member communicating with said sorting space through a generally vertically disposed slit at the interface of said inlet member and said sorting space, said slit having a relatively high ratio of its height to its width,

said sorting space extending from said generally vertically disposed slit substantially the entire circumference of said generally vertically disposed fixed housing and narrowly tapering spirally in a plane along the entire circumference and in a direction of flow of fiber material suspension to be sorted.

4,493,767
CONVEYOR BELT FOR TRANSPORTING SLAG MATERIAL FROM A FILTERING APPARATUS

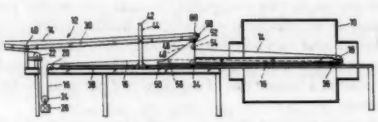
Guido Monteyne, Beukenlaan 28, 9971 Lembeke, Belgium

Filed Feb. 10, 1984, Ser. No. 578,818

Claims priority, application Luxembourg, Apr. 28, 1983, 84782

Int. Cl.³ B01D *33/06*

U.S. Cl. 210—236 11 Claims



1. A conveyor belt assembly used in conjunction with a rotary drum filtration apparatus, said conveyor belt assembly passing longitudinally through the drum, said conveyor belt assembly comprising:

fixed supporting framework means associated with a conveyor belt;

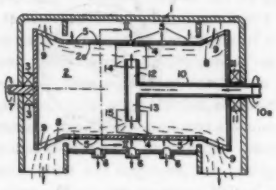
a first movable frame section having said conveyor belt thereon and being slidably mounted on said supporting framework means whereby said conveyor belt may be moved between an operative position inside said drum and a retracted position outside said drum; and

a second movable frame section having said conveyor belt thereon and being pivotably mounted on said supporting framework means, said second frame section capable of being pivoted upwardly into a raised position thereby providing a space for said first frame section to be slidably positioned thereunder.

4,493,768
TWIN PUSHER CENTRIFUGE INCLUDING ROTATABLE PUSHER

Vaclav Kubr, Oberengstringen; Bruno Müllhaupt, Schlieren, and Hansjoachim Paschedag, Männedorf, all of Switzerland, assignors to Sulzer-Escher Wyss Ltd., Zurich, Switzerland

Filed Aug. 29, 1983, Ser. No. 527,563
Claims priority, application Switzerland, Sep. 6, 1982, 5278/82
Int. Cl.³ B04B 3/02
U.S. Cl. 210—360.2 9 Claims

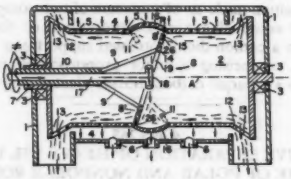


1. A twin pusher centrifuge comprising:
a rotatable sieve drum having a lengthwise axis and two oppositely situated end portions;
means for rotating said sieve drum about said lengthwise axis at a predetermined rotational speed;
a product infeed for infeeding a product to be processed into the inside of said sieve drum;
said sieve drum being provided with product discharge outlets at said two end portions;
a pusher arranged approximately centrally within said sieve drum and means for rotating said pusher about said lengthwise axis of said sieve drum at a rotational speed which is different from said rotational speed of said sieve drum, in order to simultaneoulsy convey the product infed into said sieve drum by said product infeed in respective directions extending towards both of said product discharge outlets;
said pusher comprising at least one first pushing surface extending at a first inclination relative to said lengthwise axis and the circumferential direction of said sieve drum and being directed towards the product discharge outlet of a first one of said two end portions of the sieve drum;
said pusher further comprising at least one second pushing surface extending at a second inclination relative to said lengthwise axis and the circumferential direction of said sieve drum and being directed to the product discharge outlet at a second one of said two end portions of the sieve drum;
said product infeed comprising infeed pipes each of which is connected to a related one of said at least one first and second pushing surfaces;
each one of said infeed pipes opening to the rear of the related one of said at least one first pushing surface and said at least one second pushing surfaces with respect to the related one of said two end portions and synchronously rotating with said related one of said at least one first pushing surface and second pushing surface; and
said at least one first pushing surface being arranged such that said at least one first pushing surface displaces said product at the inside of said sieve drum in a direction towards the product discharge outlet at the first one of said two end portions of the sieve drum and that said at least one second pushing surface displaces said product at said inside of said sieve drum in an opposite direction towards the product discharge outlet at the second one of said two end portions of the sieve drum, when said pusher is rotated relative to said sieve drum.

4,493,769
TWIN PUSHER CENTRIFUGE

Hansjoachim Paschedag, Männedorf; Bruno Müllhaupt, Schlieren, and Vaclav Kubr, Oberengstringen, all of Switzerland, assignors to Sulzer-Escher Wyss Ltd., Zürich, Switzerland

Filed Aug. 29, 1983, Ser. No. 527,564
Claims priority, application Switzerland, Sep. 6, 1982, 5277/82
Int. Cl.³ B04B 3/02
U.S. Cl. 210—360.2 18 Claims



1. A twin pusher centrifuge comprising:
a centrifuge housing;
a sieve drum defining a lengthwise axis and arranged in said housing;
said sieve drum having two oppositely located ends and an inner wall;
means for rotating said sieve drum about said lengthwise axis thereof at a predetermined rotational speed;
said sieve drum being provided with product discharge outlets at said two oppositely located ends;
at least one product infeed;
a pusher floor member located approximately at a central region of said sieve drum;
means for rotating said pusher floor member about said lengthwise axis at a rotational speed which is different from said predetermined rotational speed of said sieve drum;
said pusher floor member possessing an outer edge portion facing said inner wall of said sieve drum;
said outer edge portion circumferentially extending adjacent said inner wall of said sieve drum and defining a plane which is inclined relative to the lengthwise axis of the sieve drum and further defining at least two axial extreme positions in order to push a product fed-in through said at least one product infeed along said inner wall of said sieve drum to said product discharge outlets at said two oppositely located ends of said sieve drum, when said pusher floor member and said sieve drum are rotated relative to each other;
supporting webs for supporting said pusher floor member;
said pusher floor member containing a substantially central opening which at most is interrupted by said supporting webs; and
said at least one product infeed extending into said substantially central opening and opening approximately at said substantially central opening in order to substantially uniformly supply said product towards both sides of said outer edge portion of said pusher floor member.

4,493,770
METHOD AND SYSTEM OF GENERATING HEAT BY BIOLOGICAL DECOMPOSITION OF ORGANIC REFUSE

Guy Moilliet, Grabs, Switzerland, assignor to UTB Umwelttechnik Buchs AG, Buchs, Switzerland

Filed Nov. 26, 1982, Ser. No. 444,796
Claims priority, application European Pat. Off., Nov. 28, 1981, 81 109992.8
Int. Cl.³ C02F 11/02, 11/04, 3/30
U.S. Cl. 210—603 11 Claims

1. Method of generating heat and biologically decomposing organic refuse, to obtain a sludge or slurry free from toxic or

pathogenic contents, in which the refuse is introduced into an aeration vessel (11), including the steps of

introducing a gas containing oxygen into the refuse in the aeration vessel to oxidize the refuse and retain the refuse in the vessel, the refuse, upon oxidation, generating heat and heating the refuse;

removing the then hot aerated refuse, in form of an aqueous suspension or slurry from the vessel (11);

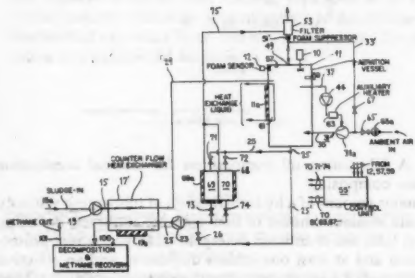
conducting the thus removed still hot refuse to a holding vessel (68; 69, 70) having at least two chambers (69, 70);

storing the aqueous suspension or slurry in the holding vessel for a period of time sufficient to degas the suspension or slurry and to reliably kill all toxic bacteria or harmful contents;

then conducting the degassed refuse in the aqueous suspension or slurry to a decomposition and methane recovery container (100) for further decomposing the contents of the degassed aqueous suspension or slurry and for recovering methane therefrom,

and wherein said conducting and storing steps comprise

selectively sequentially conducting the still hot refuse to respective separate ones of the chambers, alternately, and storing the aqueous suspension in the chambers, and then, alternately, conducting the degassed refuse from the respective chambers to the decomposition and methane recovery container, to permit alternate filling of the respective chambers, while isolating at least one of the chambers from the aeration vessel (11) and subsequent selective withdrawal of the degassed contents thereof.



4. Biological heat generating and refuse treatment apparatus, to recover heat upon decomposition of organic refuse, particularly garbage, sludge, and the like, in an aqueous suspension or slurry, and to obtain detoxified and harmless material, comprising

an aeration vessel (11) having means (31; 65) for introducing oxygen to the refuse;

controlled inlet means (15, 19) connected for introduction of said refuse into the aeration vessel (11), the organic refuse, upon introduction into the vessel, being heated by biological decomposition;

outlet means (25) connected to said aeration vessel, located remotely from the inlet means for removing said organic refuse which became hot upon biological decomposition in the vessel (11);

a degassing chamber means (68; 69, 70) connected to said outlet means (25) of said aeration vessel (11) for storing a portion of the still hot biologically decomposed contents of the aeration vessel, withdrawn therefrom, for a time sufficient to provide for degassing thereof; and

a decomposition and methane recovery container (100) connected to said degassing chamber means (68; 69, 70) downstream thereof, for further decomposing the contents from said degassing chamber means and for recovering methane therefrom;

wherein the degassing chamber means comprises at least two chambers (69, 70);

and valves (71, 72, 73, 74) selectively connecting one of said chambers (69 or 70) in the outlet (25) between the aeration vessel (11) and the decomposition and methane recovery container, for alternate filling of the respective chambers, while isolating at least one of the chambers from the aeration vessel (11), and subsequent selective withdrawal of the degassed contents thereof.

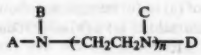
4,493,771

SCALE INHIBITING WITH COMPOUNDS CONTAINING QUATERNARY AMMONIUM AND METHYLENEPHOSPHONIC ACID GROUPS

David A. Wilson, Richwood, and Wilfred W. Wilson, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 489,442, Apr. 28, 1983, Pat. No. 4,459,241.
This application Mar. 6, 1984, Ser. No. 586,596
Int. Cl.³ C02F 5/14
U.S. Cl. 210—700 7 Claims

1. A process for inhibiting scale formation in an aqueous solution containing alkaline earth metal ions which comprises adding to said aqueous solution a threshold amount of a compound having the formula



wherein the A, B, C and D substituents are independently selected from the group consisting of hydrogen, methylenephosphonic acid or salt thereof and 2-hydroxy-3 (trialkylammonium halide) propyl wherein each alkyl has from 1 to 5 carbon atoms, n is 0 to 15, and wherein said substituents include at least one methylenephosphonic acid group, or salt thereof, and at least one 2-hydroxy-3 (trialkylammonium halide) propyl group.

4,493,772

FILTER FOR REMOVING WATER FROM WATER-CONTAINING OIL AND METHOD FOR THE SAME

Koji Tanaka, Okayama, Japan, assignor to Japan Exlan Company Limited, Osaka, Japan

Filed Dec. 28, 1981, Ser. No. 335,275
Claims priority, application Japan, Dec. 29, 1980, 55-185970
Int. Cl.³ B01D 39/04
U.S. Cl. 210—799 11 Claims

1. A water-removing filter for removing water from a water-containing oil, which comprises an assembly of fibers formed from a polymer having a SP value (solubility parameter) of at least 10.0 and, as a binder for impregnating and forming the fiber assembly, a polymeric aqueous emulsion having a surface tension of at least 50 dynes/cm, wherein the density of the filter is from 0.05 to 0.9 g/cm^3.

5. A method of separating and removing water from water-containing oil, which comprises passing the oil through a filter comprising an assembly of fibers formed from a polymer having a SP value (solubility parameter) of at least 10.0 and, as a binder for impregnating and forming the fiber assembly, a polymeric aqueous emulsion having a surface tension of at least 50 dynes/cm, wherein the density of the filter is from 0.05 to 0.9 g/cm^3.

4,493,773

LOW PHOSPHATE, SOFTENING LAUNDRY DETERGENT CONTAINING ETHOXYLATED NONIONIC, ALKYLPOLYSACCHARIDE AND CATIONIC SURFACTANTS

Thomas E. Cook, and Ernest W. Dolle, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 376,877, May 10, 1982, abandoned.
This application Jan. 27, 1984, Ser. No. 574,633
Int. Cl.³ C11D *1/62, 1/835;* D06M *13/18, 13/46*
U.S. Cl. 252—8.8 9 Claims

1. A low phosphate laundry detergent composition providing softening and/or antistatic benefits, having a pH in the laundry solution of greater than about 7, comprising from about 20% to about 80% by weight of a surfactant mixture consisting essentially of:

(a) an ethoxylated alcohol or alkylphenol nonionic detergent surfactant having an HLB of from 6 to about 14, or a mixture of such surfactants;

(b) an alkylpolysaccharide detergent surfactant of the formula $RO(C_2H_4O)_t(glycosyl)_x$, where R is an alkyl containing from about 10 to about 18 caron atoms; t is from 0 to about 10; and x is a number from about 1½ to about 3; and

(c) a quaternary ammonium cationic surfactant having 2 chains which contain an average of from about 16 to about 22 carbon atoms, or a mixture of such surfactants; the weight ratio of (a) to (b) being from about 3:1 to about 1:3, and the weight ratio of (a)+(b) to (c) being in the range of from about 3:1 to about 9:1.

4,493,774

METHOD FOR IMPROVING INJECTIVITIES OF BIOPOLYMER SOLUTIONS

James R. Bragg, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Feb. 18, 1982, Ser. No. 349,951
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—8.55 D 18 Claims

6. A method for treating an aqueous heteropolysaccharide solution prior to injecting it into a subterranean oil-bearing reservoir, said heteropolysaccharide having been produced by the action of bacteria of the genus Xanthomonas upon carbohydrates and having a concentration in the range of about 0.005 weight percent to about 20 weight percent in said solution, which comprises pumping said solution through a colloid mill until a 600 ml sample thereof is capable of passing through a 47 mm diameter 1.2 micron filter in no more than about 10 minutes at a 40 psi pressure drop across said filter, said solution having a viscosity after shearing which is substantially the same as before shearing.

4,493,775

METHOD AND COMPOSITION FOR CORROSION

M. Dewayne Coffey, South Jenks; Mary Y. Kelly, and Weldon C. Kennedy, Jr., both of Tulsa, all of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1983, Ser. No. 537,887
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—8.55 C 21 Claims

1. A corrosion inhibitor composition comprising:

(A) The product of the reaction of

(1) cyclohexylamine or an inertly-substituted derivative thereof, a salt of either of these, or mixtures thereof, with

(2) per mole of component (1), greater than about 10 moles of formaldehyde or an amount of paraformaldehyde which is sufficient to release greater than about 10 moles of formaldehyde, or a mixture thereof, and

(3) acetophenone, an inertly-substituted derivative thereof, or a mixture thereof, in an amount which is from about 3 moles per mole of component (A) (1) to an amount which is about equimolar to component (A) (2), and

(4) from zero to about 10 weight percent, based on the sum of the weights of components (A) (1), (A) (2) and (A) (3), of at least one aliphatic carboxylic acid having from 1 to about 20 carbon atoms; and

(B) a combination of

(1) at least one acetylenic alcohol, and

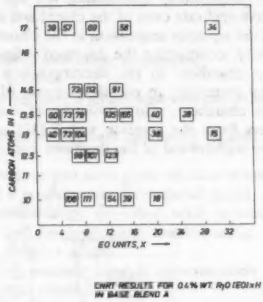
(2) additional, unreacted formaldehyde.

4,493,776

LUBRICATING OIL COMPOSITION WITH SUPPLEMENTAL RUST INHIBITOR

Robert B. Rhodes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 429,959
Int. Cl.³ C10M *1/28, 1/54*
U.S. Cl. 252—25 8 Claims



CMHT RESULTS FOR 0.6% WT. $R_1O(EO)_xH$ IN BASE BLEND A

1. A lubricating oil composition for internal combustion engines comprising:

a major amount of a hydrocarbon oil of lubricating viscosity and a minor amount of conventional additives, including at least one overbased detergent additive for rust protection and at least one ashless dispersant, and an effective amount of a supplemental rust inhibitor containing at least one compound selected from each of the groups consisting of

(A) $R_1O[C_2H_4O]_xH$ and $R_2O[C_3H_6O]_yH$ with (B) $R_3O[C_2H_4O]_x[C_3H_6O]_yH$ and $R_4O[C_3H_6O]_y[C_2H_4O]_xH$, wherein R_1, R_2, R_3 and R_4 are hydrocarbyl radicals selected from alkyl, aryl, alkaryl, and arylalkyl groups or combinations thereof having from about 10 to 15 carbon atoms and wherein x and y may vary independently in the range from 3 to 8.

4,493,777

WATER-BASED HYDRAULIC FLUIDS

Kenneth L. Snyder, Jr., and James Peters, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1982, Ser. No. 451,132
Int. Cl.³ C10M *3/04, 3/12*
U.S. Cl. 252—49.3 21 Claims

1. A substantially oil-free hydraulic fluid or metalworking composition which maintains an essentially Newtonian and shear stable viscosity comprising an aqueous liquid and a thickening amount of a substantially water-swellable synthetic addition copolymer comprising the reaction product of (1) at least one water-soluble ethylenically unsaturated monomer in an amount sufficient to provide swellability to said copolymer, (2) at least one water-insoluble ethylenically unsaturated monomer in an amount sufficient to control the degree of swellability of said copolymer, and (3) at least one crosslinking monomer in an amount sufficient to control the degree of swellabil-

ity of said copolymer while imparting mechanical reinforcement to said copolymer; such that the viscosity of said composition approaches that of an oil-based hydraulic fluid or metalworking composition.

4,493,778

WATER-BASED MAGNETIC COATING COMPOSITION

Sikandar Iqbal, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jul. 14, 1982, Ser. No. 397,986
Int. Cl.³ H01F *1/28*
U.S. Cl. 252—62.54 **20 Claims**

1. In an aqueous coating composition for forming a magnetic recording layer, this layer including magnetic pigment material and a water-based polymeric matrix therefor, this matrix including binder material comprising high molecular weight poly blends of hard and soft polymers adapted to form "interpenetrating elastomeric networks" in the presence of the magnetic pigment;

the improvement comprising the use of sufficient polyacrylic latex polymer, as a dispersant in an aqueous solution to which the pigment is added, to adequately stabilize the pigment material, after mixing, and bond it to the binder material with little or no migration to the surface of the finished recording layer, and also so as to avoid flocculation and aggravated foaming.

4,493,779

PROCESS FOR THE PREPARATION OF FERRITE MAGNETIC PARTICULATE FOR MAGNETIC RECORDING

Kouzi Kamiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 14, 1984, Ser. No. 580,162
Claims priority, application Japan, Feb. 16, 1983, 58-24254
Int. Cl.³ C04B *35/26*
U.S. Cl. 252—62.59 **3 Claims**

1. A process for the preparation of a hexagonal ferrite magnetic particulate for magnetic recording having the formula $RFe_{12-2x}M_xM^1_xO_{19}$ wherein R is at least one metal atom selected from the group consisting of barium, strontium and lead, M is at least one divalent metal atom selected from the group consisting of cobalt, nickel and zinc, M^1 is at least one tetravalent metal atom selected from the group consisting of titanium, zirconium and hafnium, and x is a number from 0.6 to 1.0 which comprises steps of:

(1) melting a starting material mixture containing basic components for said hexagonal ferrite, and a glass-forming component,

(2) rapidly cooling the resulting molten mixture to obtain an amorphous material,

(3) heat-treating said amorphous material to form ferrite crystals, and

(4) removing components other than the ferrite crystals from the materials resulting from said heat-treatment;

characterized in that said starting material mixture contains a glass-forming component comprising a B_2O_3 component and a SiO_2 component in which the molar ratio of $SiO_2/(B_2O_3+SiO_2)$ is, 0.05 to 0.8, said ferrite having a higher saturation magnetization than the ferrite of the same particle size prepared as above absent the SiO_2 component.

4,493,780

WATER-BASED HYDRAULIC FLUIDS HAVING IMPROVED LUBRICITY AND CORROSION INHIBITING PROPERTIES

Ellen S. Schwartz, Warren, Mich., and Cline A. Tincher, Homewood, Ill., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 249,200, Mar. 30, 1981, Pat. No. 4,390,439. This application May 20, 1983, Ser. No. 496,467
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.³ C09K *3/00*; C10M *3/04*
U.S. Cl. 252—73 **14 Claims**

1. A hydraulic fluid concentrate characterized by improved anti-wear and corrosion inhibiting properties comprising water, neodecanoic acid in the amount of about 0.3 to 20.0 percent by weight of said concentrate, a polyether thickener having a molecular weight of about 1000 to about 75,000 prepared by reacting ethylene oxide or ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing polyhydric alcohol initiator and at least one glycidyl ether having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said glycidyl ether is present in the amount of about 1 to about 20 percent by weight based upon the total weight of said polyether thickener, and conventional hydraulic fluid additives.

4,493,781

POWDERED CLEANSING COMPOSITION

Francis E. Chapman, and Robert B. Harris, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 6, 1981, Ser. No. 251,564
Int. Cl.³ C09K *3/22*
U.S. Cl. 252—88 **8 Claims**

1. A particulate textile fiber or fabric cleaning composition, having a high affinity for textile soil normally resistant to vacuum removal and adapted for distribution without dusting to natural or synthetic textile fibers or fabric and for expeditious removal therefrom, which comprises:

(a) from about 5 to 50% by weight of an aqueous volatile solvent in amounts sufficient to control dusting and to provide uniformity in said particulate composition;

(b) from about 10 to 95% by weight of an inert, highly absorbent carrier in sufficient amounts to cooperate in removing textile soil and to form a central wetted core; and

(c) from about 15 to 90% by weight of a natural or synthetic aluminosilicate zeolite in sufficient amounts to effectively remove textile fiber or fabric soil, said zeolite formulated to become anchored to said central core to resist dusting.

4,493,782

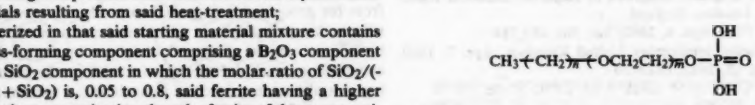
CLEANSING COMPOSITIONS COMPRISING ETHOXYLATED ALCOHOL MONOESTERS OF PHOSPHORIC ACID

Stanley C. Williamson, Des Moines, Iowa, assignor to Amchem Products, Inc., Ambler, Pa.

Filed Jul. 7, 1983, Ser. No. 511,690
Int. Cl.³ C11D *1/34, 3/36*
U.S. Cl. 252—95 **8 Claims**

1. A cleansing composition containing

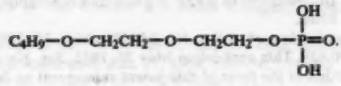
(a) from about 0.1 to about 20% by weight of a mixture of monoesters of phosphoric acid of the formula



wherein n has a value from about 7 to about 11 and m has

a value from about 2 to about 4, wherein said mixture contains at least 95% of said monoesters,

(b) from about 2 to about 3% by weight of an ester of the formula



4,493,783

CLEANING AGENT FOR OPTICAL SURFACES

Kai C. Su; Leslie F. Stebbins, both of Roswell, Ga., and Rajkumar P. Bhatia, Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 255,861, Apr. 20, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,181

Int. Cl.³ C11D 7/26; A61K 7/00

U.S. Cl. 252—174.23 19 Claims

1. An aqueous ophthalmic cleansing composition for cleaning a soft contact lens comprising an effective amount of a substantially spherical particulate polymer for removal of proteinaceous and lipid deposits on said soft contact lens, said particulate polymer selected from the group consisting of polyethylene, cellulose acetate butyrate, polycarbonate, poly 11-undecamide, polyvinyl chloride and mixtures thereof wherein said particulate polymers have a particle size in the range from about twenty microns to about one hundred microns, a carrier in which said particulate polymer is suspended, said carrier having a viscosity sufficient to keep the particulate polymer in suspension and a preservative, to provide an isotonic cleansing composition.

4,493,784

DEHYDRATION OF ALUMINUM CHLORIDE HEXAHYDRATE

Gleb Mamantov, and Charmaine B. Mamantov, both of Knoxville, Tenn., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 30, 1984, Ser. No. 575,109

Int. Cl.³ C09K 3/00; C01F 7/58

U.S. Cl. 252—182 10 Claims

1. A process for dehydrating aluminum chloride hexahydrate which comprises:

(a) contacting the hexahydrate with a melt consisting essentially of a chlorobasic mixture of least one alkali metal chloride and aluminum chloride at a temperature within the range of about 160° to 250° C. to form gaseous HCl and an oxychloroaluminate-containing reaction mixture;

(b) contacting said reaction mixture with gaseous HCl at a temperature within the range of about 160° to 250° C. to form and release water from the reaction mixture; and

(c) recovering an alkali metal chloride/aluminum chloride melt enriched in $AlCl_3$.

4,493,785

ANTHRAQUINONE COMPOUNDS

David F. Newton, Oldham, and David J. Thompson, Manchester, both of England, assignors to Imperial Chemical Industries PLC, London, England

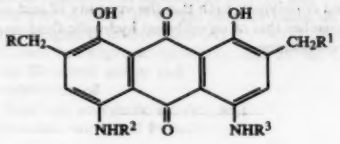
Filed Apr. 6, 1983, Ser. No. 482,714

Claims priority, application United Kingdom, Apr. 7, 1982, 8210260; Aug. 18, 1982, 8223726

Int. Cl.³ C09K 3/34; G02F 1/13; C07C 97/26, 49/74

U.S. Cl. 252—299.1 8 Claims

1. A compound of the formula:



wherein

R & R^1, each independently, represents C_{4-7}-n-alkyl; and

R^2 & R^3, each independently, represents H or C_{1-4}-alkyl.

8. A mixture of pleochroic dyes containing a first compound according to claim 1 in which both R and R^1 represent n-butyl or n-hexyl and both R^2 and R^3 represent H, a second compound according to claim 1 in which both R and R^1 represent n-butyl or n-hexyl and R^2 and R^3 represent C_{1-4}-alkyl and a third compound according to claim 1 in which both R and R^1 represent n-butyl or n-hexyl, R^2 represents H and R^3 represents C_{1-4} alkyl.

4,493,786

TRANSLUCENT SOAPS AND PROCESSES FOR MANUFACTURE THEREOF

David P. Joshi, Plainfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,443

Int. Cl.³ C11D 9/48, 9/50, 13/08, 13/14

U.S. Cl. 252—368 20 Claims

1. A translucent soap cake which comprises about 45 to 90% of mixed tallow and coconut oil soaps which are soaps of a base selected from the group consisting of lower alkanolamine and alkali metal hydroxide, and mixtures thereof, with from about 40 to 90% of the soap being a tallow soap and about 60 to 10% of the soap being a coconut oil soap, about 1 to 10% of lanolin fatty acids, about 2 to 12% of a polyol of 3 to 6 carbon atoms and 2 to 6 hydroxyl groups, and about 5 to 25% of water.

4,493,787

SEMI-CONDUCTIVE COMPOSITIONS, BASED ON ETHYLENE-VINYL ACETATE COPOLYMERS, HAVING ADHESION TO AND STRIPPABILITY FROM CROSSLINKED POLYOLEFIN SUBSTRATES

Seiho Taniguchi, Yokohama, and Yuichiro Sakuma, Nagareyama, both of Japan, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 20, 1982, Ser. No. 398,770

Claims priority, application Japan, Oct. 8, 1981, 56-159446

Int. Cl.³ H01B 1/06

U.S. Cl. 252—511 15 Claims

1. A semi-conductive composition comprising an ethylene-vinyl acetate copolymer containing 15 to 30 percent by weight vinyl acetate and having a melt index of 1 to 50 g/10 min. or a chlorinated product thereof containing 3 to 40 percent by weight chlorine, carbon black, a silicone compound selected from the group consisting of silicone oils, silicone rubbers and silicone block copolymers which are liquid at normal temperatures, in an amount of about 0.3 to about 5 parts by weight and an interface crosslink inhibitor selected from the group consisting of a phenol, a quinone, a thiazole and a thiuram sulfide in an amount of about 0.01 to about 1.5 parts by weight, said parts by weight based on 100 parts by weight of said copolymer.

4,493,788

FOAMABLE ELECTROCONDUCTIVE POLYOLEFIN RESIN COMPOSITIONS

Akira Fujie, and Minoru Hisamatsu, both of Suzuka, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1982, Ser. No. 406,817
Int. Cl.³ H01B 1/06
U.S. Cl. 252—511 5 Claims

1. An electroconductive polyolefin resin foam containing 70 to 95 percent by weight of a polyolefinic resin and 5 to 30 percent by weight of an electrically-conductive, hollow particulate furnace black having a specific surface area of at least 900 square meters per gram.

4,493,789

ELECTROCONDUCTIVE PASTE AND PROCESS FOR PRODUCING ELECTROCONDUCTIVE METALLIZED CERAMICS USING THE SAME

Tamotsu Ueyama, and Takao Yamada, both of Katsuta, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 248,676, Mar. 30, 1981, abandoned.
This application Mar. 8, 1983, Ser. No. 473,213
Claims priority, application Japan, Mar. 31, 1980, 55-42391; Mar. 31, 1980, 55-42392
Int. Cl.³ H01B 1/06
U.S. Cl. 252—514 25 Claims

1. A highly electroconductive paste for metallizing comprising:

(a) 100 parts by weight of high-melting point metal powder selected from the group consisting of tungsten powder, molybdenum powder, molybdenum-manganese powder, platinum powder and mixtures thereof,

(b) 0.1 to 3 parts by weight of an additive which is one or more sintering promoters for alumina and alumina ceramics selected from the group consisting of magnesium oxide, calcium oxide, silicon oxide, aluminum oxide and mixtures thereof, and which can fill vacant spaces among particles of said metal powder and can shrink and condense said metal powder without proceeding sintering of said metal powder,

(c) a binding agent, and

(d) a solvent.

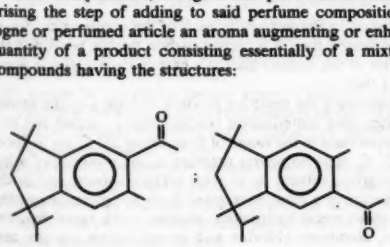
4,493,790

ORGANOLEPTIC USE OF ISOPROPYL TETRAMETHYLINDANES

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, and Roger E. Greene, Oakhurst, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 431,999, Sep. 30, 1982, Pat. No. 4,466,908.
This application Oct. 12, 1983, Ser. No. 541,263
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.³ C11B 9/00
U.S. Cl. 252—522 R 2 Claims

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said perfume composition, cologne or perfumed article an aroma augmenting or enhancing quantity of a product consisting essentially of a mixture of compounds having the structures:



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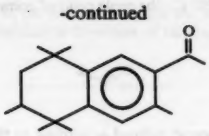
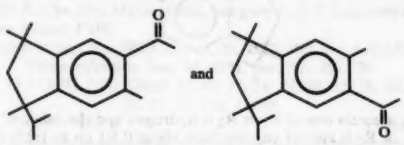
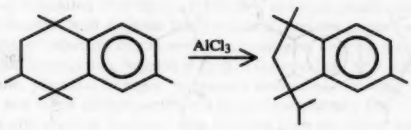


wherein a major proportion of the mixture consists of the compound having the structures:

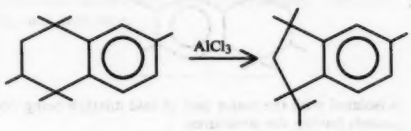


produced according to the process consisting of the steps of:

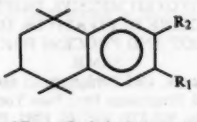
(i) first rearranging hexamethyl tetralin with an aluminum chloride catalyst according to the reactions:



and



said first reaction taking place in the presence of tetrachloro ethylene solvent which is saturated with aluminum trichloride, said reaction taking place in the presence of an excessive aluminum chloride, the weight ratio of aluminum chloride:tetrachloro ethylene varying from about 35:100 up to about 60:100, the temperature of said first reaction varying from about −10° C. up to +10° C. and the time of reaction varying from about 0.5 hours up to about 10 hours, the weight ratio of tetrachloro ethylene:-hydrocarbon reactant having the structure:



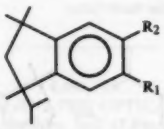
wherein one of R_1 or R_2 is hydrogen and the other of R_1 or R_2 is methyl varying from about 100:75 down to about 100:25; and

(ii) acylating the resulting product with a compound having the structure:

wherein Z represents a moiety selected from the group consisting of acetoxy, chloro and bromo, the reaction being carried out at a temperature of from about −10° up

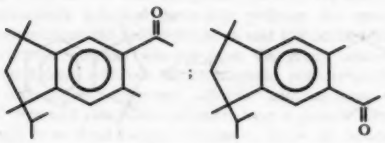
to about +20° C.; the mole ratio of compound having the structure:

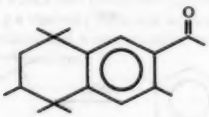
to the compound defined according to the structure:



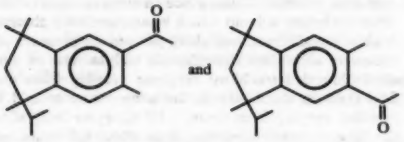
wherein one of R_1 or R_2 is hydrogen and the other of R_1 or R_2 is methyl varying from about 0.5:1 up to 1:0.5; and then

(iii) subjecting the resulting reaction product to fractional distillation whereby a mixture of compounds having the structures:





is isolated with the major part of said mixture being compounds having the structures:



4,493,791

SUBSTITUTED METHYL ISOPROPYL OXOCYCLOHEXANE DERIVATIVES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Philip T. Klemarczyk, Old Bridge, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

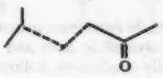
Division of Ser. No. 343,571, Apr. 26, 1982, Pat. No. 4,451,403. This application Oct. 12, 1983, Ser. No. 541,264

Int. Cl.³ A61K 7/40

U.S. Cl. 252—522 R **3 Claims**

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of admixing with said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of a product produced according to the process of:

(a) reacting isobutyraldehyde with acetone in the presence of a catalyst selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide, aluminum chloride, sulfuric acid and pyrrolidinium acetate in the presence of an inert solvent, the mole ratio of isobutyraldehyde:acetone varying from about 1.5:0.5 up to 0.5:1.5 isobutyraldehyde:acetone, the reaction temperature varying from about 25° C. up to about 120° C., thereby forming a mixture of compounds defined according to the structure:



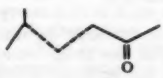
wherein in the mixture, one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond;

(b) then dimerizing the resulting mixture of ketones to form a mixture of cyclic dimers, the dimerization reaction being carried out at a temperature in the range of from about 25° C. up to about 120° C. at atmospheric pressure in the presence of a hydrocarbon solvent or an inert alkanol solvent and in the presence of a catalyst selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, aluminum chloride and pyrrolidinium acetate; and then

(c) reacting the resulting ketone dimer mixture with hydrogen in the presence of a hydrogenation catalyst selected from the group consisting of palladium, palladium on a carbon support, palladium on a calcium carbonate support or palladium on a barium sulfate support at a hydrogen pressure of from 50 psig up to 10 atmospheres, the mole ratio of hydrogen:ketone dimer reactant being in the range of from 1:1 hydrogen:ketone dimer up to about 3:1 hydrogen:ketone dimer, the reaction being carried out in an inert solvent and the reaction temperature varying from about 20° C. up to about 100° C.

2. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of a product produced according to the process comprising the steps of:

(a) reacting acetone with isobutyraldehyde in the presence of a catalyst selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, aluminum chloride, sulfuric acid and pyrrolidinum acetate in the presence of an inert solvent, the mole ratio of isobutyraldehyde:acetone varying from 1.5:0.5 up to 0.5:1.5 isobutyraldehyde:acetone the temperature of reaction varying from about 25° C. up to about 120° C. and the concentration of catalyst in the reaction mass varying from about 50 grams per liter up to about 400 grams per liter whereby a mixture of compounds is formed defined according to the structure:



wherein in the mixture in each of the compounds, one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; and then

(b) dimerizing the resulting product to form a cyclic ketone dimer, said dimerization reaction being carried out at a temperature in the range of from about 25° C. up to about 120° C. at atmospheric pressure in the presence of a hydrocarbon solvent or an inert alkanol solvent and in the presence of a catalyst selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, aluminum chloride and pyrrolidinium acetate; and then

(c) reacting the resulting ketone dimer with an alkali metal borohydride whereby the ketone moiety is reduced to a carbinol moiety in the presence of a lower alkanol solvent which is inert in the reaction mass, the concentration of alkali metal borohydride in the reaction mass varying from about 20 grams per liter of reaction mass up to about 50 grams per liter of reaction mass, the concentration of ketone dimer in the mixture varying from 200 grams per liter up to about 800 grams per liter and the reaction temperature being in the range of from 40° C. up to 70° C.

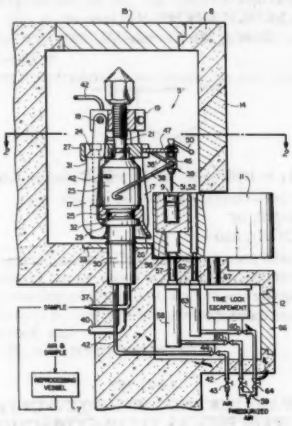
3. The process of claim 2 wherein in the process for producing the product there exists the additional step of reacting the resultant carbinol mixture with acetic anhydride at a temperature in the range of from 90° C. up to about 120° C., the mole ratio of acetic anhydride:alcohol reactant mixture varying from about 1:0.5 up to about 2:1 alcohol:acetic anhydride.

4,493,792

METHOD AND APPARATUS FOR MINIMIZING DIVERSION OF RADIOACTIVE SAMPLES FROM A NUCLEAR FUEL SAMPLING SYSTEM

Walter A. Graf, Jr., Saratoga, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 11, 1980, Ser. No. 168,792
Int. Cl.³ G21F 7/06
U.S. Cl. 252—627 **12 Claims**



1. Apparatus for minimizing diversion of radioactive samples from a nuclear fuel sampling system, comprising:

(a) means for drawing a radioactive sample from a vessel containing nuclear fuel;

(b) a shielded enclosure surrounding the sample drawing means and having solid walls for shielding personnel from exposure to radiation and for preventing direct physical access to the sample drawing means;

(c) a tray located in a wall of the shielded enclosure for translating a sample vessel supported thereby between a sampling position in the shielded enclosure and a second position outside of the shielded enclosure, said tray being configured so that only one sample vessel can be translated between said positions;

(d) means for moving a sample vessel within the shielded enclosure between its supported position by the tray and a spaced position for receiving a radioactive sample from the sample drawing means;

(e) means interlocking said sample drawing means and said vessel moving means with said tray such that a sample can only be drawn and said vessel can only be moved from its supported position to its spaced position when said tray is in its sampling position; and

(f) means connected to the tray for periodically immobilizing the tray in its secured position for a period of time sufficient to minimize diversion of radioactive samples.

4,493,793

SOLUBLE IMMUNOASSAY REAGENT COMPRISING LECTIN COVALENTLY BONDED TO REACTIVE COMPONENT

Albert E. Chu, San Mateo, Calif., assignor to E-Y Laboratories, San Mateo, Calif.

Division of Ser. No. 972,921, Dec. 26, 1978, Pat. No. 4,371,515. This application Aug. 14, 1981, Ser. No. 292,739
Int. Cl.³ C07G 7/00; G01N 33/48, 33/54, 33/68, 33/78; A61K 39/29, 39/106, 35/78
U.S. Cl. 260—112 R **5 Claims**

1. A soluble immunoassay reagent reaction product comprising a lectin covalently bonded to one reactive component capable of reacting with a corresponding component to form an immunological conjugate pair, said lectin including at least one free reactive receptor site having specificity for at least one type of sugar, said reactive component being selected from the group consisting of antigens, antibodies, and biologically reactive haptens, said antigens being selected from the group consisting of albumin, carcinoembryonic antigen, choriogonadotropin, haptoglobin, hepatits B surface antigen, IgE, IgG, IgM, insulin, placental lactogen, pregnancy-associated macroglobulin, and vibris cholerae-exotoxin lipopolysaccharide; said biologically reactive haptens being selected from the group consisting of cortisol, estrogens, progesterone, 1 thyrotropin, opiates, amphetamine, barbituate, methadone, benzoyl ecogonine (cocaine metabolite), diphenylhydantoin, primidone, digoxin, and thyroxine.

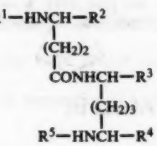
4,493,794

PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Yoshihiko Kitaura, Sakurai; Osamu Nakaguchi, Toyonaka; Keiji Hemmi, Suita; Satoshi Yonishi, Kadoma; Hidekazu Takeno, Tenri; Satoshi Okada, Takatsuki, and Masashi Hashimoto, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 9, 1981, Ser. No. 328,997
Claims priority, application United Kingdom, Dec. 31, 1980, 8041627; Apr. 14, 1981, 8111797
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 R **3 Claims**

1. A compound of the formula or its pharmaceutically acceptable salt:



wherein

R^1 is heptanoyl, stearoyl, 2-hydroxypropionyl or 2-acetylpropionyl,

R^2 is carboxy or benzylcarboxy,

R^3 is carbamoyl or 1-carboxyethylcarbamoyl,

R^4 is carbamoyl, and

R^5 is hydrogen, t-butoxycarbonyl or benzyloxycarbonyl.

4,493,795

SYNTHETIC PEPTIDE SEQUENCES USEFUL IN BIOLOGICAL AND PHARMACEUTICAL APPLICATIONS AND METHODS OF MANUFACTURE

John J. Nestor, Jr., San Jose; John G. Moffatt, Los Altos, and Hardy W. Chan, Belmont, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 17, 1983, Ser. No. 542,633
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 E 4 Claims

1. The polypeptide which has the amino acid sequence, H-Tyr-Gly-Ala-Ser-Asp-Ser-Asn-Val-Tyr-Asp-Leu-Cys-OH, and the pharmaceutically acceptable salts thereof.

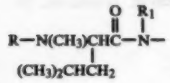
4,493,796

DIDEMNINS A, B, C, AND DERIVATIVES THEREOF, AS ANTIVIRAL AGENTS

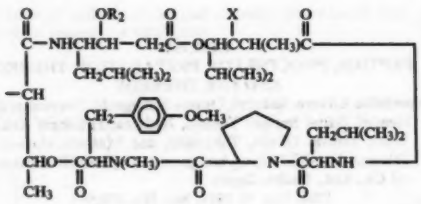
Kenneth L. Rinehart, Jr., Urbana, Ill., assignor to Board of Trustees, Univ. of Ill., Urbana, Ill.

Continuation-in-part of Ser. No. 461,346, Jan. 27, 1983, which is a continuation-in-part of Ser. No. 217,768, Dec. 18, 1980, which is a continuation-in-part of Ser. No. 186,932, Sep. 12, 1980, abandoned. This application Mar. 13, 1984, Ser. No. 589,199
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 14 Claims

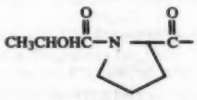
1. A didemnin of the Formula I



I

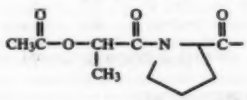


wherein R is
(a) hydrogen,
(b) —$COCH_3$,
(c) a side chain of Formula II,



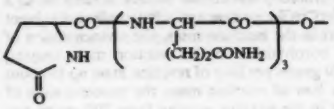
II

(d) a side chain of Formula III,

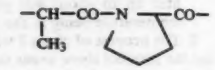


III

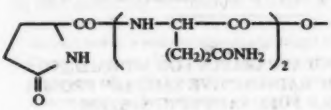
(e) $CH_3CHOHC(O)$—,
(f) a side chain of Formula IV,



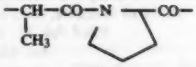
IV



(g) a side chain of Formula V,



V



(h) $CH_3CH_2(CO)$—,
(i) $(CH_3)_2CHCH_2CH(NH_2)C(O)$—, or
(j) a side chain of the formula VI,

VI

wherein R_1 is hydrogen; or R and R_1 taken together form methylene (—CH_2—); wherein R_2 is
(a) hydrogen, or
(b) —$COCH_3$; and
wherein X is
(a) =O, or
(b) H, —OH,
or an acylate thereof.

4,493,797

APPARATUS AND METHOD INVOLVING SUPERCRITICAL FLUID EXTRACTION

Michael M. Avedesian, 128 Beacon Hill Rd., Beaconsfield, Quebec, Canada (H9W 1S9)

Filed Dec. 22, 1983, Ser. No. 564,500
Int. Cl.³ C07G *1/00*
U.S. Cl. 530—507 10 Claims

1. A method to extract lignin from a black liquor containing lignin comprising (2) dissolving a black liquor containing lignin in a supercritical fluid, at about or above critical temperature and pressure, (b) separating the black liquor depleted from said lignin from the supercritical fluid containing lignin.

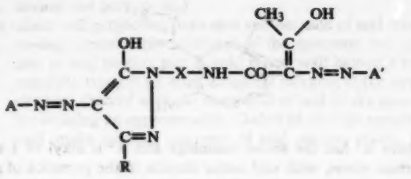
4,493,798

METAL COMPLEXES OF DISAZO DYES

Fabio Beffa, Riehen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Sep. 8, 1981, Ser. No. 299,690
Claims priority, application Switzerland, Sep. 19, 1980, 7060/80
Int. Cl.³ C09B *45/00*
U.S. Cl. 534—697 11 Claims

1. A metal complex dye containing a disazo dye of the formula



in which A and A′ independently of one another are each the radical of a diazo component of the benzene or naphthalene series, at least one of the groups A or A′ carrying a metallizable hydroxyl or carboxyl group in the o-position relative to the azo group, and X is phenylene, naphthylene, C_2–C_4-alkylene, sulfophenylene, sulfonaphthylene, halophenylene, halonaphthylene, C_1–C_4-alkylphenylene, C_1–C_4-alkylnaphthylene, C_1–C_4-alkoxyphenylene or C_1–C_4-alkoxynaphthylene and R is C_1–C_4-alkyl, COO—Q or CONQQ_1, in which Q and Q_1 are each hydrogen or C_1–C_4-alkyl.

4,493,799

SYNTHESIS OF SUCCINONITRILES

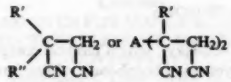
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 214,612, Dec. 9, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,788

Int. Cl.³ C07C *121/28, 121/60, 120/02*

U.S. Cl. 260—465 H **8 Claims**

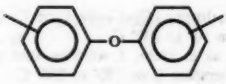
1. A process for preparing a succinonitrile corresponding to the formula:



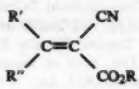
wherein:

R′ and R″ are independently each occurrence hydrogen or a substituent of up to about 10 carbons selected from the group consisting of aryl, alkyl, aralkyl and amino-, cyano-, nitro-, hydroxy-, carboxy-and acetoxy-substituted derivatives thereof; and

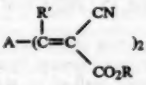
A is $C_{1\text{-}6}$ alkylene, phenylene or



comprising contacting an α-cyanoacrylate ester corresponding to the formula:



or



wherein

R′, R″ and A are as previously defined, and

R is a substituent of up to about 10 carbons selected from the group consisting of aryl, alkyl and aralkyl,

with an alkali metal cyanide in a ratio of from about 1 to about 1.1 equivalents of cyanide reactant for each equivalent of α-cyanoacrylate ester reactant in a solvent mixture comprising water and a member selected from the group consisting of aliphatic and aromatic hydroxyl-containing compounds having up to about 20 carbons, chlorinated hydrocarbons and aprotic polar solvents at an elevated temperature.

4,493,800

PROCESS FOR PREPARING A TRIFLUOROMETHYLBENZENE DERIVATIVES

Yasuhisa Furutaka, Takatsuki, and Sadamu Ishii, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

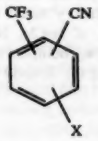
Filed Jun. 21, 1983, Ser. No. 506,358

Claims priority, application Japan, Jun. 23, 1982, 57-108822; Jun. 23, 1982, 57-108823

Int. Cl.³ C07C *120/04*

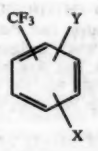
U.S. Cl. 260—465 D **4 Claims**

1. A process for preparing trifluoromethylbenzonitrile derivative of the formula:



(I)

wherein X is hydrogen, lower alkyl, halogenated lower alkyl, lower alkoxy, nitro, hydroxyl, amino, cyano, carboxyl or sulfon, which comprises reacting a trifluoromethylhalogenobenzene derivative of the formula:



(II)

wherein X is as defined above, and Y is halogen with copper(I) cyanide in a solvent selected from the group consisting of hexamethylphosphoric triamide, N-methylpyrrolidone and mixture thereof in the presence of a catalyst selected from the group consisting of (A) bromine, (B) iodine, (C) a combination of bromine or iodine and metallic copper and (D) copper(II) bromide.

4,493,801

PREPARATION OF TERTIARY ALCOHOLS

Franz Merger, Frankenthal, and Gerhard Nestler, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

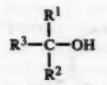
Filed Nov. 2, 1981, Ser. No. 317,001

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045378

Int. Cl.³ C07C *121/34, 67/00*

U.S. Cl. 260—465.6 **10 Claims**

1. A process for the preparation of a tertiary alcohol of the formula

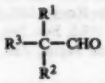


I

where R^1, R^2 and R^3 can be identical or different and each is alkyl of 1 to 8 carbon atoms, and at least one of the members

R^1, R^2 and R^3 is substituted by cyano, or the carbon chain in at least one of the members R^1, R^2 and R^3 is interrupted by

the oxy group being oriented in the direction of the aldehyde group, which process comprises: reacting a tertiary aldehyde of the formula



II

where R^1, R^2 and R^3 have the above meanings, with free oxygen or air at an elevated temperature of about 60° to 160° C. and in a reaction medium consisting essentially of the reaction components and, as optional additional components, an organic solvent and/or a heavy metal salt catalyst selected from the group consisting of $NiCl_2$, $Ni(OCOCH_3)_2$, VCl_3, $CrCl_3$ and their corresponding complex compounds; and

separating and recovering the desired tertiary alcohol I.

4,493,802

PREPARATION OF O,O'-DITHIODIBENZOIC ACIDS

Hagen Jaedicke, Ludwigshafen, and Peter Tonne, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

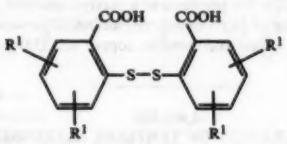
Filed Jan. 5, 1983, Ser. No. 455,806

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201904

Int. Cl.³ C07C *143/52, 149/40*

U.S. Cl. 260/507 R **20 Claims**

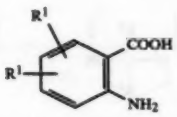
1. In a process for the preparation of o,o'-dithiodibenzoic acid of the formula



I

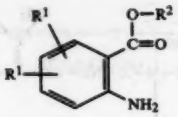
where the individual radicals R^1 may be identical or different and are each hydrogen, halogen, nitro, $-SO_3H$ or alkyl of 1 to 6 carbon atoms, by reaction of a diazotized anthranilic acid derivative with sulfur dioxide in the presence of an acid, water and a catalyst for destroying the diazonium salt, the improvement which comprises:

reacting a diazonium salt of an anthranilic acid of the formula



II

or a diazonium salt of an anthranilate of the formula



III

where R^1 has the above meanings and R^2 is alkyl of 1 to 8 carbon atoms, with said sulfur dioxide in the presence of said acid and water and in the presence of a copper salt as the essential catalyst destroying the diazonium salt in a 1st stage at from 20° to 50° C. and then in a 2nd stage at from 80° to 100° C.

4,493,803

PROCESS FOR THE PREPARATION OF VINYLPHOSPHONIC ACID DIESTERS AND VINYLPHOSPHONIC ACID

Hans-Jerg Kleiner, Kronberg, and Walter Dürsch, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 380,351, May 20, 1983, abandoned, and a continuation-in-part of Ser. No. 380,352, May 20, 1983, abandoned. This application Jun. 24, 1983, Ser. No. 507,510

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120438; May 22, 1981, 3120437

Int. Cl.³ C07F *9/38, 9/40*

U.S. Cl. 260—968 **4 Claims**

1. A method for making a vinylphosphonic acid diester of the formula

$$CH_2{=}CH{-}P(O)(OR)_2$$

wherein R is C_1–C_4-alkyl, which method comprises heating a dialkyl-2-acetoxyethane-phosphonate of the formula

$$CH_3COOCH_2CH_2P(O)(OR)_2$$

at a temperature from 150° C. to 270° C. in the presence of an acidic or basic catalyst to form a vinylphosphonic acid monoester, and then reacting this monoester with an orthoester of the formula

$$R^1C(OR)_3,$$

wherein R^1 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy, at a temperature from 30° to 200° C.

2. A method as in claim 1 wherein said phosphonate is heated to a temperature from 170° to 230° C.

4,493,804

VARIABLE VENTURI-TYPE CARBURETOR

Norihiko Nakamura; Takaaki Itoh; Takashi Katou, all of Mishima; Yozo Ota, Chiryu, and Toshiharu Morino, Mie, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

Continuation of Ser. No. 404,831, Aug. 3, 1982, abandoned. This application Jun. 7, 1984, Ser. No. 617,844

Claims priority, application Japan, Dec. 31, 1981, 56-209790

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 C **6 Claims**

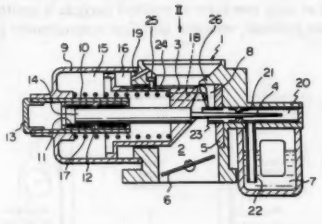
1. A variable venturi-type carburetor comprising:

an axially-extending intake passage formed in the carburetor and having an inner wall of an approximately circular cross section;

a suction piston transversely moveable in said intake passage from one side to another side thereof in response to a change in the amount of air flowing within said intake passage, said suction piston having a tip face which defines

a venturi portion in said intake passage and has an upstream end portion; and

a raised wall projecting from said another side of said intake passage immediately upstream of the upstream end portion of said suction piston, said raised wall having a substantially straight tip edge arcuately merging at the opposite ends thereof with the inner wall of said intake passage for defining an approximately D-shaped air inlet mouth of said intake passage upstream of said suction piston, the



upstream end portion of the tip face of said suction piston having an approximately V-shaped cross section which expands toward said venturi portion, the straight tip edge and arcuate merging ends of said raised wall cooperating with the V-shaped upstream end to define an approximately isosceles triangular air inlet opening, said inlet opening gradually reducing in area as the suction piston approaches said another side when the amount of air flowing within said intake passage is reduced.

4,493,805

METHOD AND OVEN FOR MANUFACTURING A LIGHT CONSTRUCTION ELEMENT, PARTICULARLY A COVER PLATE

Gustav-Adolf Sporkenbach, Lister Meile 21, D-3 Hannover 1, Fed. Rep. of Germany, and Dieter Suetterlin, Frick, Switzerland, assignors to Keller Holding AG, Pfungen, Switzerland and Gustav-Adolf Sporkenbach, Hanover, Fed. Rep. of Germany, a part interest

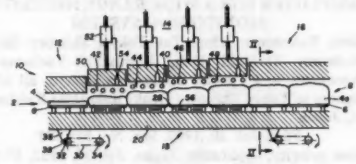
PCT No. PCT/CH82/00067, § 371 Date Dec. 20, 1982, § 102(e) Date Dec. 20, 1982, PCT Pub. No. WO82/03885, PCT Pub. Date Nov. 11, 1982

PCT Filed May 10, 1982, Ser. No. 456,015

Claims priority, application Switzerland, May 8, 1981, 2986/81

Int. Cl.³ B29H *7/20*

U.S. Cl. 264—25 **12 Claims**



1. A method of manufacturing a light construction element, particularly a cover plate, comprising the steps of:

mold-free shaping a blank comprising a first layer in the form of a massive, dimensionally-stable body composed of a first clay material which is expandable on firing, a second layer composed of a second clay material which is non-expandable under the conditions of said firing of said first clay material, and an interface between said first layer and said second layer;

arranging the mold-free blank thus obtained such that said second layer forms a lower layer and supporting said mold-free blank by means of said lower layer thereof; and

firing said mold-free blank while supporting the same by means of said lower layer thereof;

whereby said first layer composed of said first clay material is expanded and sintered to said second layer composed of said second clay material which is non-expandable under the conditions of said firing, at said interface formed between said first layer and said second layer.

4,493,806

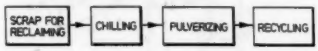
RECYCLING OF CONTAMINATED PLASTIC

Christopher Hatzikelis, R.R. #1, Palgrave, Ontario, Canada; Ciro Madonia, 1390 Beaufort Dr., Burlington, Ontario, Canada, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, Canada

Filed May 29, 1981, Ser. No. 268,385

Int. Cl.³ B02C *19/00, 23/00*; B29B *3/00*

U.S. Cl. 264—28 **5 Claims**



1. The method of recycling polyvinyl chloride plastic formed material having in intimate adherent relation therewith a layer of polyester film said film normally having the property as a contaminant of causing undue discolouration of said polyvinyl chloride upon the melting thereof, comprising the step of chilling the material to a temperature in the range of minus 150° F. to minus 200° F. to severely embrittle the material , mechanically pulverizing the chilled material to a powder form having said contaminant dispersed therewith to provide a reclaimed colourable material, and forming said reclaimed material into a desired shape.

4,493,807

PROCESS FOR PRODUCING SHEET-LIKE STRUCTURES FROM VINYL ALCOHOL POLYMERS

Rudolf Vyvial, Ludwigshafen; Christof Taubitz, Wachenheim; Lothar Schlemmer, Maxdorf; Gerhard Bleckmann, Lampertheim; Manfred Zuerger, Sinsheim; Heinrich Krieger, Telgte, and Heino Thiele, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,615

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147326

Int. Cl.³ B29F *3/03*

U.S. Cl. 264—101 **17 Claims**

1. A process for the production of a sheet-like structure from a vinyl alcohol polymer which comprises, in sequence, the following steps:

separately feeding into a self-cleaning multi-screw extruder, in the direction of product flow, first the vinyl alcohol polymer and then an amount of water which is insufficient to dissolve the polymer under standard conditions of temperature and pressure,

and, while transporting them through the extruder,

mixing the vinyl alcohol polymer and the water at temperatures in the range of from 20° to 100° C. to achieve uniform distribution of the polymer and the water,

melting the polymer/water mixture and homogenizing the melt at temperatures in the range of from 80° to 200° C.,

devolatilizing the homogeneous melt to remove any excess water and to adjust the water content of the melt to the water content desired in the end product without the extrudability of the melt being adversely affected hereby and to remove other undesirable volatile constituents, and

discharging the melt from the extruder while simultaneously shaping it into the sheet-like structure,

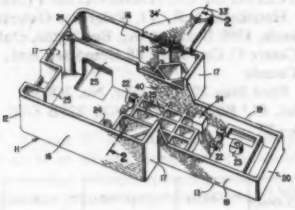
wherein the stated temperatures being the barrel temperatures of the extruder.

4,493,808

METHOD OF MOLDING A SEWING MACHINE FRAME OF FIBER REINFORCED COMPOSITION

Robert Sedlatschek, Bridgewater, and Leo E. McGann, Cranford, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 4, 1982, Ser. No. 384,846
Int. Cl.³ B29D 3/02
U.S. Cl. 264—108 3 Claims



1. The method of molding with fiber reinforced thermosetting composition a sewing machine bed having a main section and extending from said main section a work supporting channel section having one open side, the method comprising:

(a) providing a mold formed with a cavity having the shape of said joined main and channel sections;

(b) injecting the fiber reinforced thermosetting composition into said mold while in a fluid state;

(c) arranging the orientation of the fibers comprising the reinforcing of said solidified composition largely parallel to the length of said channel section at the juncture of said main and channel sections of said article by the technique of gating the mold so as to control the flow of glass fiber reinforced thermosetting composition to occur generally transversely across said channel section of said mold cavity at the juncture of said main channel sections therof;

(d) effecting solidification and cure of said injected fiber reinforced composition within said mold.

4,493,809

URANIUM THORIUM HYDRIDE NUCLEAR FUEL

Massoud T. Simnad, La Jolla, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Mar. 8, 1982, Ser. No. 355,361
Int. Cl.³ G21C 3/60
U.S. Cl. 376—171 2 Claims

1. A fuel for a nuclear reactor comprising between about 5 and 10 percent by weight uranium in the form of fine particles and at least about 90 percent by weight thorium hydride, having a hydrogen to thorium atom ratio of at least about 2, in which said uranium particles are dispersed, the thorium moiety being substantially entirely fertile ^{232}Th and the relative amounts of uranium and thorium hydride providing that during the active life of the fuel, sufficient ^{233}U will be bred from said thorium moiety so that said bred ^{233}U will contribute substantially to the neutron population the hydrogen moiety providing effective moderation of fission neutrons.

4,493,810

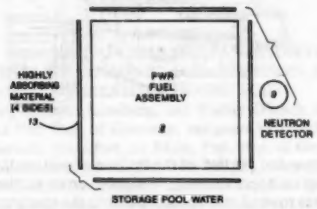
METHOD AND APPARATUS FOR MEASURING REACTIVITY OF FISSILE MATERIAL

David M. Lee, Los Alamos, and Lloyd O. Lindquist, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1982, Ser. No. 415,616
Int. Cl.³ G21C 17/00
U.S. Cl. 376—254 14 Claims

1. A nondestructive, non-invasive method of determining at least one quantity selected from the group consisting of fissile content, reactivity, and burnup of a fissile material contained within a multiplying system bounded by an arbitrarily chosen physical boundary, wherein said multiplying system comprises (a) said fissile material which emits neutrons and has fissionable components and (b) a second material which comes in contact with said fissile material, said method using no external neutron-emitting interrogation source, said method comprising:

(a) making a first measurement N_A of emitted particle-count rate of at least one type of emitted particle selected from the group consisting of neutrons and gamma rays, wherein said at least one type of emitted particle is emitted by said fissile material, wherein said first measurement is made by



using at least one suitable detector, and wherein a first reflector material is positioned adjacent to said multiplying system while said first measurement is made;

(b) making a second measurement N_B of emitted particle-count rate of said at least one type of emitted particle emitted by said fissile material, wherein said second measurement is made by using at least one suitable detector, wherein a second reflector material replaces said first reflector material and is reproducibly positioned adjacent to said multiplying system while said second measurement is made; and then

(c) using the equation

$$\frac{N_A - N_B}{N_A} = M_B \Delta k_{eff},$$

wherein M_B is the multiplication and Δk_{eff} is the change in the effective multiplication constant k_{eff}, determine the local multiplication or average multiplication, and wherein said multiplying system is not changed during the time period in which steps 1(a) and 1(b) are performed.

4,493,811

PREAMPLIFIER FOR A WIDE RANGE NEUTRON FLUX MONITORING SYSTEM

Eiji Seki, Yokohama; Ichiro Tai, Tokyo; Shimpey Shirayama, Yokohama; Toshiaki Itoh, Kawasaki; Yorimasa Endo, Tokorozawa, and Toshiki Fukushima, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 20, 1983, Ser. No. 515,588
Claims priority, application Japan, Jul. 26, 1982, 57-129810
Int. Cl.³ G21C 17/00
U.S. Cl. 376—254 4 Claims

1. A preamplifier for a wide range neutron flux monitoring system, which is supplied with wide range neutron flux level signals from a neutron detector provided in a reactor, comprising:

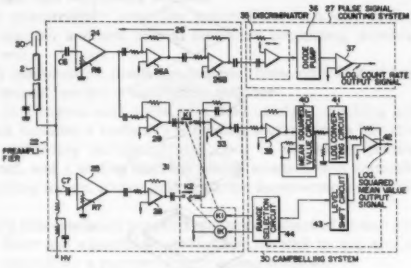
a first amplifier for a high frequency band which includes a low input impedance circuit receiving at the input terminal thereof said wide range neutron flux level signals;

a second amplifier for a low frequency band which includes a high input impedance circuit receiving at the input terminal thereof said wide range neutron flux level signals;

a third amplifier for amplifying the pulse signals supplied

from the output terminal of said first amplifier and for supplying the output signals therefrom to a pulse signal counting system;

a fourth amplifier for a low frequency band which receives the output signals from said second amplifier and amplifies Campbell signals of a first frequency range, said Campbell signals being included in said output signals from said second amplifier;


35 DISCRIMINATOR
27 PULSE SIGNAL COUNTING SYSTEM
DISC. PULSE OUTPUT SIGNAL
LOG SQUARED MEAN VALUE OUTPUT SIGNAL
30 CAMPBELLING SYSTEM

a fifth amplifier for a high frequency band which receives the output signals from said first amplifier and amplifies Campbell signals of a second frequency range, said Campbell signals being included in said output signals from said first amplifier; and

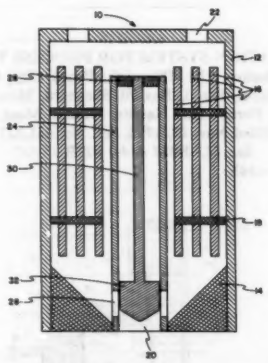
switching means for selectively switching the output signals from said fourth and fifth amplifiers to a Campbelling system.

4,493,812

NUCLEAR RADIATION ACTUATED VALVE

David W. Christiansen, Kennewick, and Dixon P. Schively, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1982, Ser. No. 340,621
Int. Cl.³ G21C 7/32
U.S. Cl. 376—352 **8 Claims**



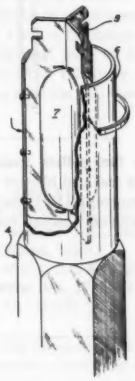
1. A valve for controlling fluid flow in a nuclear reactor comprising: a tube having an opening in the wall thereof adjacent one end of said tube, a rod coaxially mounted within said tube and having a piston at one end thereof adjacent said opening, said piston adapted to at least partially block said opening to define the effective size thereof, means connecting the other end of said rod to the other end of said tube, said tube and said rod formed of materials, respectively, having different nuclear radiation swelling properties whereby exposure to nuclear radiation during reactor operation causes differential swelling and consequent relative movement between said tube and said rod to displace said piston and vary the effective size of said opening.

4,493,813

NEUTRON PROTECTION DEVICE

Pierre Loriot, Venelles; Michel Rendu, and Jean Rousseau, both of Aix en Provence, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Sep. 14, 1982, Ser. No. 418,165
Claims priority, application France, Sep. 30, 1981, 81 18413
Int. Cl.³ G21C 3/04
U.S. Cl. 376—409 **11 Claims**



1. In a nuclear reactor fuel assembly comprising a foot and an assembly body connected to the foot having an upper part and a lower part, an upper neutron protection device comprising:

a wall of substantially hollow shape and having an inner face and an outer face, said wall being fixed to said assembly body at the upper part thereof,

at least one container comprising:

a closed outer cylindrical envelope,

an inner cylindrical envelope placed within said outer cylindrical envelope and whose thickness is smaller than the thickness of the outer envelope,

a deformable tube located inside said inner cylindrical envelope and defining a space between said deformable tube and said inner cylindrical envelope, said space being incompletely filled with a product having a high neutron absorption cross-section, said at least one container being disposed within said wall and maintained by at least one spacing plate which is fixed to the inner face of the wall.

4,493,814

HIGH URANIUM UTILIZATION FUEL ROD FOR LIGHT WATER REACTORS

Charles L. Beard, Jr., Murrysville, and Thomas M. Camden, Apollo, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1982, Ser. No. 377,117
Int. Cl.³ G21C 3/28
U.S. Cl. 376—428 **4 Claims**

1. A fuel rod for a fuel assembly for a light water nuclear reactor, said rod having a cladding tube and comprising:

a plurality of pellets comprising UO_2 retained within said cladding tube in axially stacked relationship, said stacked pellets comprising blanket pellets, low density fuel pellets and standard fuel pellets;

said blanket pellets positioned at both ends of said pellet stack and comprising UO_2 having added thereto a relatively low enrichment of U-235 as oxide;

said standard fuel pellets comprising U-235 enriched UO_2 pellets of the type normally used in light water nuclear reactors; and

said low density fuel pellets positioned intermediate said standard pellets and said blanket pellets, said low density fuel pellets comprising U-235 enriched UO_2 but having a lower linear uranium loading than that of said standard fuel pellets.

4,493,815

SUPPORTING AND FILTERING BIOCHEMICAL TEST PLATE ASSEMBLY

George G. Fernwood, San Anselmo, and Samuel Burd, Oakland, both of Calif., assignors to Bio-Rad Laboratories, Inc., Calif.

Filed Jul. 28, 1983, Ser. No. 518,231
Int. Cl.³ B01D *25/04*; G01N *33/48*
U.S. Cl. 422—101 **5 Claims**

1. A biochemical test plate assembly for use in both filter assays and static blot assays, said assembly comprising:

an upper planar template having upper and lower surfaces and containing a plurality of discrete apertures communicating an array of openings in said upper surface with an array of openings in said lower surface,

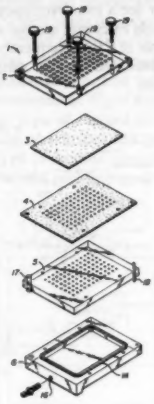
a microporous film underlying said upper template and having dimensions sufficiently large to encompass said array of openings in the lower surface of said upper template,

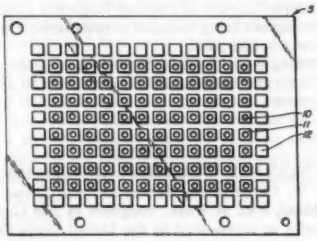
a gasket underlying said microporous film, having dimensions sufficiently large to encompass said array of openings in the lower surface of said upper template, and having an array of discrete apertures in alignment with said lower surface openings of said upper template,

a lower planar template underlying said gasket, having an array of discrete apertures in alignment with said lower surface openings of said upper template, each of said apertures terminating at its upper end in a flat boss extending upward from said lower template, the uppermost surfaces of said bosses being coplanar and parallel to said lower template,

a base plate underlying said lower template having a central recess of dimensions sufficiently large to encompass said array of apertures in said lower template, said recess defining an enclosed chamber below said lower template,

means for forming a substantially air-tight seal around said enclosed chamber between said lower template and said base plate,





means for securing said upper template, film, gasket, lower template and base plate together to seal said gasket against said bosses, and

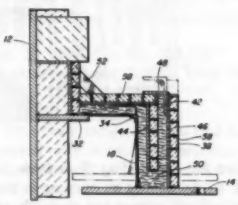
means for applying a vacuum to said enclosed chamber.

4,493,816

INSULATION SYSTEM FOR PROCESS VESSEL

Donald E. Becker, 129 Whitworth, Ponca City, Okla. 74601; Alan C. Hayes, Rte. 1, Box 70, Shepherd, Mont. 59079, and Joseph W. Porter, 1612 Natalie, Billings, Mont. 59101

Filed Nov. 12, 1982, Ser. No. 441,027
Int. Cl.³ B01J *8/44*; F27B *15/04*
U.S. Cl. 422—143 **7 Claims**



1. In a reaction vessel which contains a vertically extending section and a horizontally extending section including a means for supporting a reaction mass thereabove, and a sealing member which attaches said vertically extending section to said horizontally extending section, the improvement comprising:

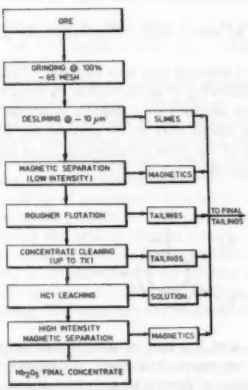
(a) a first insulation supporting member attached to said horizontally extending section, wherein said first supporting member extends substantially parallel to and spaced apart from a portion of said sealing member;
(b) a second insulation supporting member attached to said vertically extending section, wherein said second supporting member extends substantially parallel to and spaced apart from said sealing member and is movable relative to said first supporting member;
(c) compressible insulation material between said sealing member and said second insulation supporting member; and
(d) compressible insulation material between said first and second insulation supporting members.

2. In a regenerator vessel of a fluid catalytic cracking unit which includes a vertically extending section and a horizontally extending perforated grid floor in the lower portion thereof, and a sealing member which attaches said vertically extending section to said grid floor, the improvement comprising:
(a) a first insulation supporting member attached to said grid floor and extending substantially parallel to and spaced apart from a portion of said sealing member;
(b) a second insulation supporting member attached to said vertically extending section and extending substantially parallel to and spaced apart from said sealing member and being movable relative to said first insulation supporting member;
(c) compressible insulation material between said sealing member and said second insulation supporting member; and
(d) compressible insulation material between said first and second insulation supporting members.

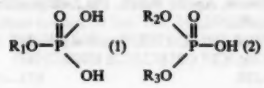
4,493,817
PROCESS FOR RECOVERING PYROCHLORE MINERAL CONTAINING NIOBIUM AND TANTALUM

Rudy Biss, Chicoutimi Nord, Canada, assignor to Teck Corporation, Vancouver and Soquem-Societe Quebecoise d'Exploration Miniere, St. Foy, both of, Canada

Filed Jul. 6, 1983, Ser. No. 511,253
Int. Cl.³ B01D *11/00*
U.S. Cl. 423—62 **13 Claims**



1. Process for recovering a concentrate of pyrochlore mineral containing niobium and tantalum from an ore containing pyrochlore mineral particles containing Ta_2O_5 in a weight ratio of Ta_2O_5:Nb_2O_5 of at least about 0.04:1 and gangue materials, said process comprising the steps of: forming an aqueous pulp of the ore in a small particle size suitable for froth flotation; conditioning the pulp by bringing into admixture therewith (a) a collector selected from the group of monofunctional and difunctional phosphoric acid esters of the formulae



and mixtures thereof wherein R_1, R_2, and R_3 are independently selected from the group consisting of alkyl groups of about 8 to 16 carbon atoms, in an amount sufficient to collect said pyrochlore present in the pulp to provide a concentrate froth relatively rich in said pyrochlore mineral containing niobium and tantalum, and (b) an acid-reacting compound compatible with said ore, gangue and collector in an amount sufficient to modify the pH of the pulp to a pH in the range about 1.5 to about 6.5; subjecting the conditioned pulp to froth flotation; and recovering a concentrate froth relatively rich in said pyrochlore mineral containing niobium and tantalum.

4,493,818
PHOSGENE REMOVAL PROCESS

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

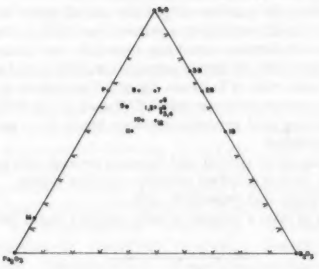
Continuation-in-part of Ser. No. 440,104, Nov. 8, 1982, abandoned. This application Jan. 27, 1984, Ser. No. 574,315
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—240 **10 Claims**

1. A process for removing phosgene from an off gas containing phosgene which comprises contacting said off gas with an aqueous solution comprising 1 to 25 weight percent of an alkali metal hydroxide and an amount effective to remove phosgene of a tertiary amine compound having 3–20 carbon atoms.

4,493,819
CERAMIC STRONTIUM FERRITE BORATE

Howard L. Glass, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 3, 1983, Ser. No. 519,797
Int. Cl.³ C01B *33/20*
U.S. Cl. 423—277 **1 Claim**



1. A compound of the formula

$$Sr_3Fe_2O_{7-x}B_2O_3,$$

wherein said compound has a cubic crystal structure of lattice constant approximately 15.2 angstroms, wherein x can vary from zero to two to account for the variation in oxygen content associated with the variable valence of iron.

4,493,820

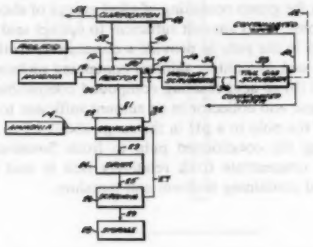
PROCESS FOR PARTIAL REMOVING OF IMPURITIES FROM A WET PROCESS PHOSPHORIC ACID

Herbert J. Clausen, Apollo Beach, Fla., assignor to Gardinier, Inc., Tampa, Fla.

Filed Oct. 1, 1982, Ser. No. 432,297

Int. Cl.³ C01B 25/28; C02B 7/00

U.S. Cl. 423—310 **6 Claims**



1. Process for the partial removal of impurities including Fe_2O_3 AL_2O_3, and MgO, in a primary scrubber liquid produced in the primary scrubbers of an ammonium phosphate plant comprising the steps of,

(a) discharging the primary scrubber liquid containing impurities from the primary scrubbers, said liquid having a N:P mole ratio of between about 0.5 and about 1.2, and a P_2O_5 content between about 27% and about 40%, and,

(b) clarifying all or part of said discharged primary scrubber liquid to remove at least a portion of said impurities.

6. Process for the partial removal of impurities including Fe_2O_3 AL_2O_3, and MgO, from the primary scrubber liquid produced in the primary scrubbers of an ammonium phosphates plant comprising the steps of,

(a) reacting ammonia with phosphoric acid in a reactor to produce an ammonium phosphate slurry and reaction off-gases,

(b) discharging said slurry into a granulator wherein recycled dry granules of ammonium phosphate are wetted with slurry,

(c) ammoniating said wetted granules in said granulator,

(d) drying said wetted granules of step (c),

(e) sizing said dried granules into product size granules and off-size granules,

(f) recycling at least a portion said off-size granules to said granulator for wetting with said slurry,

(g) cooling said product size granules,

(h) scrubbing the reaction off-gas and the off-gases obtained in steps (c) (d) and (g) in a primary scrubber with phosphoric acid thereby removing ammonia, and ammonium phosphates dust, to form a primary scrubber liquid having a N:P mole ratio of between about 0.5 and about 1.2, and a P_2O_5 content between about 27% and about 40%,

(i) discharging said primary scrubber liquid from said primary scrubber,

(j) clarifying all or part of said flows to remove said impurities and form a clarified primary scrubber liquid,

(k) discharging said impurities, and

(l) feeding at least a portion of said clarified liquid into said reactor.

4,493,821

PRESERVATIVE AND FIXATIVE PREPARATIONS FOR BIOLOGICAL SYSTEMS

James S. Harrison, 12 Sioux La., Ringwood, N.J. 07456

Filed Feb. 4, 1982, Ser. No. 345,589

Int. Cl.³ G01N 31/00, 33/52; C09K 3/00, 15/00

U.S. Cl. 424—3 **31 Claims**

1. A fixative and preservative composition for histological, cytological and proteinaceous preparations which comprises as a principal active fixative and preservative component, a mixture of from about 10 to about 75% by weight of pyrrolid-2-one, from about 10 to about 50% by weight of a polyol, from about 1 to about 20% by weight of a urea and from about 1 to about 10% by weight of a zinc salt of a nonoxidizing organic or inorganic acid, the relative percentages of said ingredients being selected from within the respective ranges so that their sum is 100% of said mixture.

17. A device for fixing and preserving histological, cytological and proteinaceous preparations comprising a base strip of material which is non-absorbent to and insoluble in water and carrying thereon at least one deposition area in which area is carried the evaporative residue of a fixative and preservative composition according to claim 1.

4,493,822

DOSAGE UNITS

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 270,181, Jun. 3, 1981, Pat. No. 4,376,111. This application Feb. 10, 1983, Ser. No. 465,394

Claims priority, application United Kingdom, Dec. 4, 1980, 997904; Dec. 5, 1980, 8038993; Apr. 28, 1981, 8112987

Int. Cl.³ A61K 9/00, 9/44, 47/00

U.S. Cl. 424—15 **10 Claims**

1. An orally administrable pharmaceutical dosage unit comprising a solid main body having at least two main faces, each of said main faces having tilting means such that the most stable position of said dosage unit on a horizontal flat surface is a tilted position, said tilting means being free of any cutting edge formations.

4,493,823

TOPICAL COSMETIC PREPARATIONS FOR THE TREATMENT OF OILY HAIR AND SEBORRHEIC SKIN

Hinrich Möller; Siegfried Wallat, both of Monheim; Friedhelm Bartnik, and Wolfgang Pittermann, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

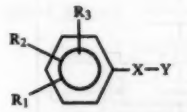
Filed Nov. 10, 1981, Ser. No. 319,915

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047106

Int. Cl.³ A61K 7/06, 7/09, 31/36, 31/235

U.S. Cl. 424—70 **6 Claims**

1. A process of treating oily hair and seborrheic skin which comprises administering to an individual in need of such treatment an effective amount of a topical cosmetic preparation comprising from about 0.01 to 20 percent by weight, based upon the weight of the total preparation, of at least one compound of the formula



(I)

wherein R_1, R_2, and R_3, any of which may be the same or different, each represent hydrogen, hydroxyl, or —OR_4, where R_4 is an alkyl of from 1 to 6 carbon atoms or a benzyl, or two of the groups R_1, R_2, and R_3 represent methylenedioxy; X is an alkylene of from 1 to 3 carbon atoms; and Y is —COOH, —$CONR_5R_6$, or —$COOR_7$, where R_5 and R_6 each represent hydrogen, alkyl of from 1 to 6 carbon atoms, or benzyl and R_7 is an alkyl of from 1 to 6 carbon atoms or a benzyl, where each of the benzyl and alkylene may have one or more non-interfering substituents selected from the group

consisting of lower alkyl, halogen, nitro, lower alkanoyl, lower alkoxy, and methylenedioxy.

4,493,824

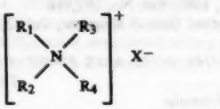
HAIR RINSE COMPOSITION

Yoshiaki Abe, Tokyo, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 200,399, Oct. 24, 1980, abandoned. This application Aug. 4, 1982, Ser. No. 405,280
Claims priority, application Japan, Jan. 9, 1980, 55-1112
Int. Cl.³ A45D 7/00; A61K 7/06, 7/08
U.S. Cl. 424—70 1 Claim

1. A hair rinse composition consisting essentially of the following three components (A), (B) and (C):

(A) 0.1 to 20 percent by weight of one or more quaternary ammonium salts represented by the general formula (I):



where two of R_1, R_2, R_3 and R_4 are each a long chain alkyl group having 8 to 20 carbon atoms and the rest of them are each an alkyl group having 1 to 3 carbon atoms, a benzyl group or a polyoxyethylene group consisting of a total of not more than 10 molar monomer units; and X is a halogen atom;

(B) 0.1 to 20 percent by weight of a dimethylpolysiloxane represented by the following formula:

$$(CH_3)_3SiO[(CH_3)_2SiO]_{x_1}Si(CH_3)_3$$

(where, x_1 is an integer of 3 to 650); and

(C) 0.1 to 30 percent by weight of polyethylene glycol having an average molecular weight of 200 to 100,000.

4,493,825

PURIFIED AND ANTIGENICALLY SELECTIVE VACCINES FOR DOMESTIC ANIMALS

Kenneth B. Platt, and David E. Reed, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Oct. 5, 1982, Ser. No. 432,967
Int. Cl.³ A61K 39/00, 39/12, 39/02
U.S. Cl. 424—88 8 Claims

1. The method of preparing a purified antigenically selective vaccine for a domestic animal, comprising:

(a) preparing by in vitro microorganism culture an aqueous admixture of the desired animal disease immunizing agent together with other antigenic protein and culture residue substances, said immunizing agent being selected from the class consisting of pathogenic microorganisms and immunizing antigenic protein derived therefrom;

(b) complexing the IgG antibodies specific for the said immunizing agent with micro-particles having outer surfaces containing protein A selectively binding to the Fc region of the IgG antibodies so that the antibody Fab regions of the resulting first complex are oriented for binding reaction;

(c) reacting said immunizing agent in said aqueous admixture with said first complex to form a second complex;

(d) recovering said second complex from said aqueous admixture in purified form; and

(e) preparing a parenteral vaccine from said second complex by suspending an immunologically effective amount thereof in a parenterally-injectable liquid carrier for animal vaccines, said second complex containing said IgG antibodies in complexed relationship with said immunizing agent.

4,493,826

GENTAMICIN-G! EPTOFERRON COMPOSITIONS

James G. Strayer, Waterloo, Nebr., assignor to Schering Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 342,295, Jan. 25, 1982, abandoned. This application Feb. 16, 1983, Ser. No. 466,998
Int. Cl.³ A61K 35/74, 31/70, 31/71
U.S. Cl. 424—118 16 Claims

1. A stable injectable pharmaceutical composition comprising (a) about 1 to 10 milligrams per milliliter of gentamicin, (b) about 250 to 1000 milligrams per milliliter of gleptoferron containing iron and (c) water; wherein the weight ratio of iron to gentamicin is about 40 to 1.

4,493,827

METHOD OF INDUCING SLEEP

Ronald Valle, 44 Fitch St., Carteret, N.J. 07008

Filed Nov. 14, 1983, Ser. No. 551,144
Int. Cl.³ A61K 31/135, 31/161, 33/02
U.S. Cl. 424—166 3 Claims

1. A method of inducing sleep in a patient who is mentally or physically exhausted which comprises administering to a patient in need of such sleep inducing a pharmaceutically effective combination of the following compounds in the following daily dosages:

Acetaminophen—100–1,000 mg/day,
Phenylephrine hydrochloride—1–10 mg/day,
Phenylpropanolamine—5–30 mg/day,
Phenyltoloxamine dihydrogen citrate—5–30 mg/day,
Ammonium chloride—50–1,000 mg/day.

4,493,828

USE OF THYROTROPIN RELEASING HORMONE AND RELATED PEPTIDES AS POULTRY GROWTH PROMOTANTS

Frederick Leung, and Roger M. Weppelman, both of Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 26, 1982, Ser. No. 402,018
Int. Cl.³ A61K 37/02
U.S. Cl. 424—177 3 Claims

1. A method of promoting growth in poultry immediately following the exponential growth phase which comprises the daily administration to the poultry during the period from the fourth to the eighth week of life of from one to ten micrograms/bird/day of a compound of the formula:

M_1—M_2—M_3

or a pharmaceutically acceptable salt thereof, wherein

M_1 is L-pyroglutamyl (Glp), L-cycloserinyl (CSer), L-cyclothreoninyl, (CTHr), N-formyl-L-proline (HCO-Pro), L-Glutamic acid-5-methyl ester (Glu(OMe)), L-Proline (Pro), L-2-ketopiperidine-6-carbonyl (Kpc), D-2-ketopiperidine 6-carbonyl (D-Kpc), or L-2-ketoimidazolidine-4-carbonyl (Kic);

M_2 is L-histidyl (His), D-histidyl (D-His), L-leucine (Leu), L-@-methylhistidine (MeHis), L-phenylalanine (Phe), L-β-(pyrazolyl-1)alanine (Pyr(1)ala), L-β-(thienyl-2)alanine (Thi), L-im-N-methylhistidine (His(N Me)), L-β-(pyrazolyl-3)alanine (Pyr(3)ala), L-methionine (Met), or L-im-N (CH_2COOH)histidine (His(N CH_2COOH); and

M_3 is L-prolinamide (Pro-NH_2), N-(6-aminohexyl-L-prolinamide (Pro-NH$(CH_2)_6NH_2$), 2-methyl-L-alaninamide (MeAla-NH_2), N-methyl-L-prolinamide (Pro-NHMe), N-ethyl-L-prolinamide (Pro-NHEt), L-prolylglycinamide (Pro-Gly-NH_2), L-azetedinecarboxylic acid amide (Azet), L-prolyl-L-alaninamide (Pro-Ala-NH_2), N-hexyl-L-prolylamide (Pr-NH$(CH_2)_6$Me), N-cyclohexyl-L-prolinamide (Pro-NH-cyclo-hexyl), L-thiazolidine-4-carboxamide (Tca-NH_2), L-piperidine-2-carboxamide (Pc-NH_2), or Methyl L-piperidine-2-carboxylate (Pc-OMe).

4,493,829

BIO-AVAILABLE SUCCINYLATED PROTEIN-IRON DERIVATIVES WHICH DO NOT CAUSE GASTRIC LESIONS, METHOD OF PREPARATION AND RELATED PHARMACEUTICAL COMPOUNDS

Giancarlo Sportoletti; Piergiuseppe Pagella, and Pietro Cremonesi, all of Milan, Italy, assignors to Italfarmaco S.p.A., Milan, Italy

Filed Feb. 24, 1983, Ser. No. 469,282
Claims priority, application Italy, Mar. 2, 1982, 19908 A/82
Int. Cl.³ C07G 7/04
U.S. Cl. 424—177 11 Claims

1. A bio-available succinyl ferro-protein derivative obtained by reacting a succinylated animal or vegetable protein with ferro ions.

4,493,830

METHOD FOR THE TREATMENT OF IDIOPATHIC HEADACHE ATTACKS, IN PARTICULAR MIGRAINE AND CLUSTER HEADACHE

Federigo Sicuteri, Florence, Italy, assignor to Istituto Farmacologico Serono of Rome, Italy

Filed Apr. 26, 1984, Ser. No. 604,133
Claims priority, application Italy, May 4, 1983, 48225 A/83
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 424—177 6 Claims

1. Method for the treatment of idiopathic headache attacks characterized by the fact of administering a therapeutically efficacious quantity of Somatostatin.

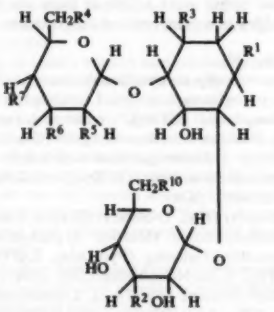
4,493,831

AMINOGLYCOSIDE DERIVATIVES

Takao Takaya, Kawanishi; Nobuyoshi Yasuda, Nishinomiya; Hideo Tsutsumi, Toyonaka, and Keiji Matsuda, Takatsuki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 30, 1983, Ser. No. 537,967
Claims priority, application United Kingdom, Oct. 25, 1982, 8230421; Apr. 18, 1983, 8310436
Int. Cl.³ A61K 31/71; C07H 15/22
U.S. Cl. 424—180 18 Claims

1. Aminoglycoside derivatives of the formula:



wherein

at least one of R^1, R^2, R^3 and R^4 is C_8–C_{24} alkanoylamino, C_8–C_{24} alkenoylamino, C_8–C_{20} alkoxycarbonylamino, C_8–C_{18} alkylaminocarbonylamino, C_8–C_{20} alkoxy C_1–C_6alkanoylamino or C_8–C_{18} alkylthiocarbonylamino, each of which is unsubstituted or substituted with hydroxy, amino, carboxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, halogen, nitro, acylamino, aryloxy, C_1–C_6 alkanoyloxy, or C_8–C_{24} alkanoyloxy, and the others are amino or acylamino,

R^5 is hydroxy, amino or acylamino,

R^6 and R^7 are each hydroxy or hydrogen, and

R^{10} is hydroxy or phosphonoxy; or

pharmaceutically acceptable salts thereof.

8. A pharmaceutical composition comprising an anti-viral effective amount of compound of claim 1 or pharmaceutically acceptable salt thereof and a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

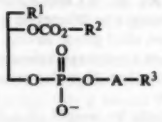
4,493,832

CERTAIN GLYCEROL-PHOSPHORYL CHOLINE DERIVATIVES, COMPOSITIONS CONTAINING SAME AND METHOD OF USING SAME

Tsutomu Teraji, Osaka; Eishiro Todo, Toyonaka; Norihiko Shimazaki, Suita; Teruo Oku, Osaka, and Takayuki Namiki, Minoo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 24, 1982, Ser. No. 391,918
Claims priority, application United Kingdom, Jul. 3, 1981, 8120612
Int. Cl.³ C07F 9/141, 9/143; A61K 31/685
U.S. Cl. 424—199 7 Claims

1. A compound of the formula:



wherein

R^1 is $C_{1\text{-}20}$ alkyl, $C_{1\text{-}20}$ alkoxy, $C_{16\text{-}20}$ alkylthio or phenyl(lower)alkoxy;

R^2 is lower alkyl or phenyl(lower)alkyl;

A is lower alkylene; and

R^3 is a group of the formula:

in which R^5, R^6 and R^7 are each hydrogen or lower alkyl; and pharmaceutically acceptable salt thereof.

7. A method for treating hypertension which comprises administering an effective amount of the compound of claim 1 to a human being.

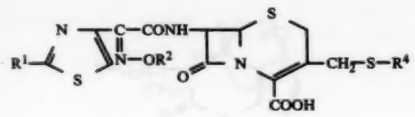
4,493,833

SYN-ISOMER OF 3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takao Takaya, Kawanishi; Takashi Masugi, Toyonaka; Hisashi Takasugi, Osaka, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 77,557, Sep. 21, 1979, Pat. No. 4,304,770, which is a continuation of Ser. No. 941,541, Sep. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 767,700, Feb. 11, 1977, Pat. No. 4,166,115. This application Aug. 25, 1981, Ser. No. 296,117
Claims priority, application United Kingdom, Apr. 12, 1976, 14916/76; Jun. 7, 1976, 23490/76; Japan, Oct. 19, 1976, 51-125826; United Kingdom, Aug. 31, 1978, 35195/78; Sep. 4, 1978, 35435/78; Belgium, Aug. 24, 1979, 6/46.924; Aug. 30, 1979, 0/196.949
Int. Cl.³ A61K 31/545; C07D 501/56
U.S. Cl. 424—246 7 Claims

1. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds of the formula:



wherein

R^1 is amino or a protected amino,

R^2 is ethyl, cyclopentyl, carboxymethyl or 3-isoxazolylmethyl;

R^4 is 1-allyl-1H-tetrazol-5-yl, and pharmaceutically acceptable salts thereof.

6. A compound, which is 7-[2-methoxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-(4-allyl-4H-1,2,4-triazol-3-yl)thiomethyl-3-cephem-4-carboxylic acid (syn isomer).

7. An antibacterial composition comprising an effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,493,834

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Nobuyoshi Yasuda, and Masayoshi Murata, both of Mino, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

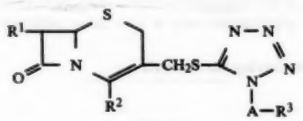
Division of Ser. No. 209,988, Nov. 24, 1980, Pat. No. 4,420,477. This application Jul. 26, 1983, Ser. No. 517,448

Claims priority, application United Kingdom, Nov. 30, 1979, 7941417

Int. Cl.³ C07D *501/36;* A61K *31/545*

U.S. Cl. 424—246 **10 Claims**

1. A cephem compound of the formula:



wherein

R^1 is amino;

R^2 is carboxy or a protected carboxy group;

A is hydroxy (lower) alkylene, amino (lower)alkylene, protected amino (lower) alkylene, lower alkenylene, hydroxyimino (lower alkylene, lower alkoxyimino (lower) alkylene, or lower alkenyloxyimino (lower) alkylene; and

R^3 is carboxy or a protected carboxy group,

and pharmaceutically acceptable salts thereof.

4,493,835

1,3,4-THIADIAZINES

Rodney B. Hargreaves, Poynton, and Bernard J. McLoughlin, Macclesfield, both of England, assignors to Imperial Chemical Industries PLC, London, England

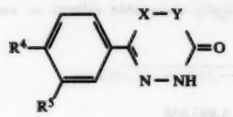
Filed Oct. 26, 1982, Ser. No. 436,802

Claims priority, application United Kingdom, Nov. 12, 1981, 8134176

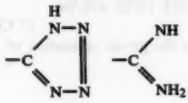
Int. Cl.³ C07D *285/16;* A61K *31/54*

U.S. Cl. 424—246 **8 Claims**

1. A heterocyclic compound of the formula



wherein X is —S— and Y is —CR^1R^2— wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms; wherein R^4 and R^5, which may be the same or different, each is hydrogen (but provided that R^4 and R^5 are not both hydrogen), or each has the formula:



—$CONHNH_2$

—$CONR^6OR^7$

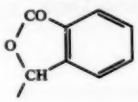
—$CONR^7R^8$

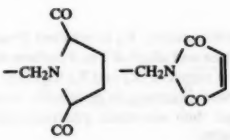
—$COOR^9$

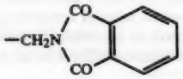
wherein R^6 and R^7, which may be the same or different, each is hydrogen, alkyl of up to 4 carbon atoms or arylalkyl of up to 10 carbon atoms; and wherein R^8 and R^9, which may be the same or different, each has the formula:

—CH_2—OCO—R^{11}

—CH_2—OCO—OR^{11}







—$(CH_2)_mOH$

—CH_2O—A—OR^{11}

—A—$NR^{12}R^{13}$

—A—$COOR^{12}$

—A—$CONR^{12}R^{13}$

wherein m is an integer from 2 to 4, A is alkylene of from 1 to 4 carbon atoms, R^{11} is alkyl of up to 4 carbon atoms and R^{12} and R^{13}, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms; or a salt thereof where appropriate.

5. A pharmaceutical composition having cardiotonic or antihypertensive activity comprising as active ingredient at

least one heterocyclic compound, claimed in claim 1, in association with a pharmaceutically-acceptable diluent or carrier therefor.

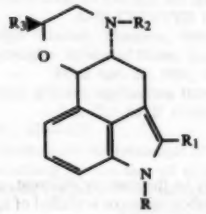
4,493,836

9-OXALYSERGIC ACID DERIVATIVES AND USES THEREOF

Lucien Nedelec, Le Raincy; André Pierdet, Villemomble, and Patrick Fauveau, Livry-Gargan, all of France, assignors to Roussel Uclaf, Paris, France

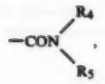
Filed May 10, 1983, Ser. No. 493,355
Claims priority, application France, May 12, 1982, 82 08249
Int. Cl.³ A61K *31/535*; C07D *498/04*
U.S. Cl. 424—248.4 **17 Claims**

1. A compound selected from the group consisting of



I

wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, chlorine and bromine, R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, aralkyl of 7 to 12 carbon atoms and cycloalkylalkyl of 4 to 7 carbon atoms, R_3 is selected from the group consisting of $—CH_2OH$, alkylthiomethyl with 1 to 4 alkyl carbon atoms, $—CH_2CN$, —COOH, —COOAlk and



Alk is alkyl of 1 to 5 carbon atoms, R_4 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_5 is alkyl of 1 to 4 carbon atoms or R_4 and R_5 together with the nitrogen form a saturated heterocycle optionally containing another heteroatom and their non-toxic, pharmaceutically acceptable acid addition salts.

10. A method of inducing antihypertensive and dopaminergic agonist activity in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim 1 sufficient to cause antihypertensive and dopaminergic activity.

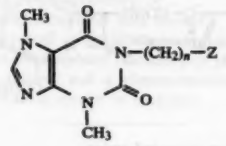
4,493,837

THEOBROMINE DERIVATIVES

Hachiro Sugimoto, Noda; Sachiyuki Hamano, Tokyo; Tadao Shoji, Kagamihara; Takeru Kaneko, Hatogaya, and Takeshi Uzuo, Shiki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

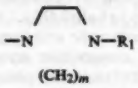
Continuation of Ser. No. 126,616, Mar. 3, 1980, abandoned. This application Oct. 20, 1982, Ser. No. 435,518
Claims priority, application Japan, Mar. 5, 1979, 54-24570
Int. Cl.³ C07D *473/10*; A61K *31/52*
U.S. Cl. 424—253 **18 Claims**

1. A compound having the formula

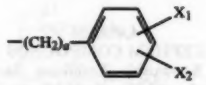


wherein Z is a member selected from the group consisting of

A. a group having the formula

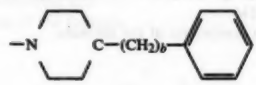


wherein m is the integer 2 or the integer 3, and R_1 is pyridyl or a group having the formula

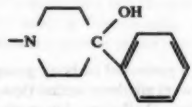


wherein X_1 and X_2, which can be the same or different, each is hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halogen, and a is an integer of 0 to 3;

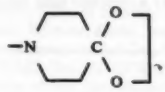
B. a group having the formula



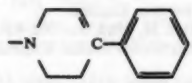
C. a group having the formula



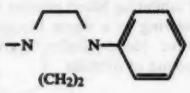
D. a group having the formula



and E. a group having the formula



and n is an integer of 2 to 8, with the proviso that when Z is



n is an integer of 3 to 8, and pharmaceutically acceptable acid addition salts thereof.

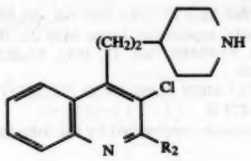
4,493,838

MEDICAMENTS CONTAINING DERIVATIVES OF 3-CHLORO-QUINOLINE

Alain A. Champseix, Orsay, and Gérard R. Le Fur, Plessis Robinson, both of France, assignors to Pharmindustrie, Gennevilliers, France

Division of Ser. No. 237,784, Feb. 24, 1981, Pat. No. 4,405,789. This application Sep. 29, 1982, Ser. No. 426,543
Claims priority, application France, Mar. 7, 1980, 80 05152
Int. Cl.³ A61K *31/47*
U.S. Cl. 424—258 **4 Claims**

1. A medicament containing as active principle an effective amount of a compound for the treatment of anxiety states and psychoneurotic states, said compound corresponding to the formula:



in which R_2 represents hydrogen, alkyl having 1 to 4 carbon atoms or phenyl, or a salt of said compound with a pharmaceutically acceptable acid, and a pharmaceutically acceptable carrier.

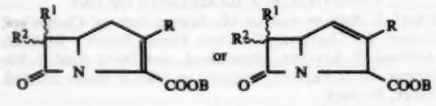
4,493,839

1-CARBAPENEM-3-CARBOXYLIC ESTERS AS ANTI-INFLAMMATORY AGENTS

James B. Doherty, New Milford; Morris Zimmerman, Watchung, and Bonnie M. Ashe, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 24, 1982, Ser. No. 380,989
Int. Cl.³ C07D *487/04*; A61K *31/40*
U.S. Cl. 424—263 **6 Claims**

1. A method of treating anti-inflammatory conditions comprising the administration to a mammalian species in need of such treatment a therapeutic effective amount of a pharmaceutical composition containing an active compound of formula:



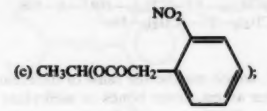
(I)

wherein

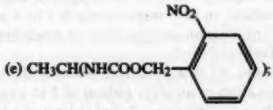
R^1 and R^2 are the same or different and are

(a) hydrogen;

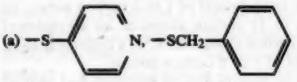
(b) $CH_3CH(OH)$— or $CH_2(OH)$—;

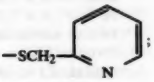


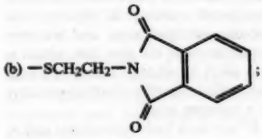
(d) when R^1 and R^2 are joined together, CH_3CH═; or



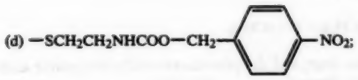
R is

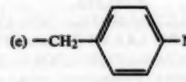






(c) $-SCH_2CH_2OH$;





or

(f) hydrogen;

B is benzyl or benzyl substituted with NO_2.

4,493,840

ANTISECRETORY GUANIDINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Tobias O. Yellin, Wallingford, Pa., and David J. Gilman, Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England and ICI Americas, Inc., Wilmington, Del.

Division of Ser. No. 83,361, Oct. 10, 1979, Pat. No. 4,309,435. This application Oct. 26, 1981, Ser. No. 314,558
Claims priority, application United Kingdom, Oct. 16, 1978, 40704/78
Int. Cl.³ C07D *277/20*; A61K *31/425*
U.S. Cl. 424—269 **10 Claims**

1. A guanidine derivative of the formula I:

$$Het^1-(CH_2)_m-Y^1-(CH_2)_n-NR^1-A-NR^2-(CH_2)_q-Y^2-(CH_2)_p-Het^2 \quad I$$

in which

Y^1 and Y^2, which may be the same or different, are oxygen or sulphur atoms, direct bonds or methylene or sulphinyl radicals;

m and p, which may be the same or different, are 0 to 4 and

n and q, which may be the same or different, are 1 to 4,

provided that when Y^1 or Y^2 is an oxygen or sulphur atom or a sulphinyl radical, m or p respectively is 1 to 4 and provided that when Y^1 or Y^2 is an oxygen atom or a sulphinyl radical, n or q respectively is 2 to 4;

one of R^1 and R^2 is a hydrogen atom and the other is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms;

A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C═Z in which Z is a sulphur or oxygen atom or a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^3$, NCO_2R^3, NSO_2R^3 or NR^4 in which R^3 is an alkyl radical of 1 to 6 carbon atoms, an aryl radical of 6 to 12 carbon atoms or an alkylphenyl radical of 7 to 12 carbon atoms and R^4 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms;

Het^1 is an oxazol-4-yl, thiazol-4-yl or imidazol-4-yl radical substituted in the 2-position by a radical of the formula III: or Het^1 is a 1,2,4-thiadiazol-3-yl or 1,2,4-oxadiazol-3-yl radical substituted in the 5-position by a radical of the formula III, in which R^5 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms;

Het^2 is an unfused 5-membered monocyclic heterocyclic ring containing at least one nitrogen atom and wherein nitrogen is the only hetero atom in the ring and which is optionally substituted an alkyl or alkoxy radical of 1 to 6 carbon atoms, a hydroxy, trifluoromethyl, hydroxymethyl or amino radical or by a halogen atom,

provided that when R^1 and R^2 are both hydrogen atoms and A is C═NH, Y^1 and/or Y^2 is a sulphur atom, and that when R^1 and R^2 are both hydrogen atoms, A is C═NH and Het^2 is imidazole, the number of atoms in the chain represented by formula V:

$$(CH_2)_q-Y^2-(CH_2)_p \quad V$$

is at least four; and the pharmaceutically-acceptable acid-addition salts thereof.

4,493,841

BLOOD-PLATELET AGGREGATION INHIBITING 4,5,7,8-TETRAHYDRO-4,4,8,8-TETRAMETHYL-2-THIENYL-1H-THIEPINO[4,5-d]IMIDAZOLE DERIVATIVES

Romano Derungs, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

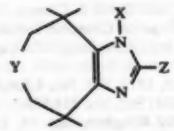
Division of Ser. No. 254,826, Apr. 16, 1981, Pat. No. 4,382,945. This application Feb. 7, 1983, Ser. No. 464,444

Claims priority, application Switzerland, Apr. 29, 1980, 3304/80; Feb. 16, 1981, 1057/81

Int. Cl.³ A61K *31/415;* **C07D** *495/04*

U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula

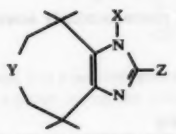


I

wherein X is hydrogen or C_{1-4}-alkyl, Y is sulfur, sulfinyl or sulfonyl and Z is thienyl, optionally substituted by methyl or fluorine,

or physiologically compatible acid addition salt thereof.

8. A method of inhibiting blood platelet aggregation which comprises administering to a warm blooded animal in need thereof an effective blood-platelet aggregation inhibiting amount of a compound of formula



I

wherein X is hydrogen or C_{1-4}-alkyl, Y is sulfur, sulfinyl or sulfonyl and Z is thienyl, optionally substituted by methyl or fluorine,

or physiologically compatible acid addition salt thereof.

4,493,842

FUNGICIDAL N-(PHENYL-LOWER ALKANOYL-)-IMIDAZOLE DERIVATIVES, COMPOSITION, AND METHOD OF USE

Kunihiko Furuzawa, Takarazuka; Yuji Funaki, Toyonaka; Yoshio Hisada, Amagasaki, and Kazuo Izumi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

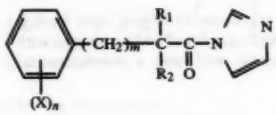
Filed May 13, 1983, Ser. No. 494,349

Claims priority, application Japan, May 21, 1982, 57-87034; May 25, 1982, 57-89483; Nov. 17, 1982, 57-202597; Nov. 22, 1982, 57-205306

Int. Cl.³ A01N *43/50;* **C07D** *233/58, 233/60*

U.S. Cl. 424—273 R **7 Claims**

1. N-acylimidazole represented by the formula:



wherein X is halogen atom, or alkyl, alkoxy, lower alkylthio, halogen-substituted alkyl, phenyl, phenoxy, cyano, phenyl lower alkoxy or nitro group, R_1 and R_2, which may be the same or different, are hydrogen or halogen atom, or alkyl, lower alkenyl, lower alkoxy, trifluoromethyl, lower cycloalkyl lower alkyl or lower alkoxy lower alkyl group, or R_1 and R_2, taken together, may form lower alkylene or halogen-substituted lower alkylene group, m is 0 or 1, n is 0, 1 or 2, and when n is 2, the $(X)_2$ groups may a form methylenedioxy group.

4,493,843

INDOLE AND INDOLINE CARBOXYLIC ACID COMPOUNDS AND METHOD OF USE

Michael J. Ashton; Andrew W. Bridge, both of Chelmsford; Robert F. Chapman, Benfleet; Garry Fenton, Romford; Anthony H. Loveless, Hornchurch, and David Riddell, Billericay, all of England, assignors to May & Baker Limited, Essex, England

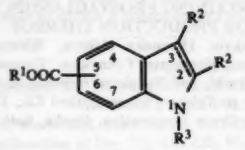
Continuation of Ser. No. 274,211, Jun. 16, 1981, abandoned. This application May 21, 1982, Ser. No. 380,838

Claims priority, application United Kingdom, Jun. 18, 1980, 8019948

Int. Cl.³ C07D *209/12;* **A61K** *31/40*

U.S. Cl. 424—274 **34 Claims**

1. Indole and indoline compound of the formula:



I

wherein ═══ indicates a double bond or a single bond between carbon atoms, R^1 represents hydrogen or alkyl of 1 through 6 carbon atoms and one of the symbols R^2 represents alkyl of 9 through 24 carbon atoms and the other symbol R^2 represents alkyl of 1 through 24 carbon atoms or hydrogen, and R^3 represents alkyl of 1 through 6 carbon atoms or hydrogen, and pharmaceutically acceptable salts thereof.

4,493,844

INSECTICIDAL 2,2'-BRIDGED(1,1'-BIPHENYL)-3-YLMETHYL CARBOXAMIDES

Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

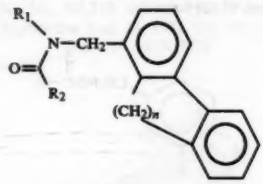
Filed Aug. 19, 1982, Ser. No. 409,751

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.³ C07C *103/737*; A01N *37/18*

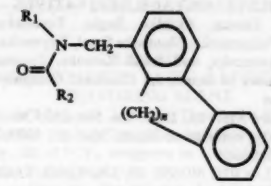
U.S. Cl. 424—275 **10 Claims**

1. Insecticidal 2,2'-bridged[1,'-biphenyl]-3-ylmethyl carboxamides of the formula



wherein n is 2–4, R_1 is hydrogen or lower alkyl, and R_2 is selected from the group consisting of 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropyl; 3-(cyclopentylidenemethyl)-2,2-dimethylcyclopropyl; 3-(2-methyl-1-propenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; 3-(1,2,2,2-tetrabromoethyl)-2,2-dimethylcyclopropyl; 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(3-chloro-2,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(2,3-dichloro-3,3-difluoro-1-propenyl)-2,2-dimethylcyclopropyl; 2,2,3,3-tetramethylcyclopropyl; 2,2-dichloro-3,3-dimethylcyclopropyl; 4-chloro-α-(1-methylethyl)phenylmethyl; 4-difluoromethoxy-α-(1-methylethyl)phenylmethyl; 3-(1,3-butadienyl)-2,2-dimethylcyclopropyl; 2,2-dimethyl-3-(oximinomethyl)cyclopropyl; 2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methylbutyl; 3-(2,3,4,5-tetrahydro-2-oxothien-3-ylidenemethyl)-2,2-dimethylcyclopropyl; 2,2-dichloro-1-(4-ethoxyphenyl)cyclopropyl; 4-halo-α-(1-cyclopropyl)phenylmethyl; spiro[2,2-dimethylcyclopropane-1,1'-[1H]-indene]-3-yl; spiro[3-(2,2-dichloroethenyl)cyclopropane-1,1'-cyclohexane]-2-yl; spiro[3-(2,2-dichloroethenyl)cyclopropane-1,1'-cyclobutane]-2-yl; 3-phenyl-2,2-dimethylcyclopropyl; 3-(4-halophenyl)-2,2-dimethylcyclopropyl; 3-(4-methoxyphenyl)-2,2-dimethylcyclopropyl; 3-(4-ethoxyphenyl)-2,2-dimethylcyclopropyl; and 3-(3,4-methylenedioxyphenyl)-2,2-dimethylcyclopropyl.

9. A method of controlling insects or acarids which comprises applying to the locus where control is desired an insecticidally or acaricidally effective amount of at least one compound of the formula



wherein n is 2–4, R_1 is hydrogen or lower alkyl, and R_2 is selected from the group consisting of 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropyl; 3-(cyclopentylidenemethyl)-2,2-dimethylcyclopropyl; 3-(2-methyl-1-propenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; 3-(1,2,2,2-tetrabromoethyl)-2,2-dimethylcyclopropyl; 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(3-chloro-2,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl; 3-(2,3-dichloro-3,3-difluoro-1-propenyl)-2,2-dimethylcyclopropyl; 2,2,3,3-tetramethylcyclopropyl; 2,2-dichloro-3,3-dimethylcyclopropyl; 4-chloro-α-(1-methylethyl)phenylmethyl; 4-difluoromethoxy-α-(1-methylethyl)phenylmethyl; 3-(1,3-butadienyl)-2,2-dimethylcyclopropyl; 2,2-dimethyl-3-(oximinomethyl)cyclopropyl; 2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methylbutyl; 3-(2,3,4,5-tetrahydro-2-oxothien-3-ylidenemethyl)-2,2-dimethylcyclopropyl; 2,2-dichloro-1-(4-ethoxyphenyl)cyclopropyl; 4-halo-α-(1-cyclopropyl)phenylmethyl; spiro[2,2-dimethylcyclopropane-1,1'-[1H]-indene]-3-yl; spiro[3-(2,2-dichloroethenyl)cyclopropane-1,1'-cyclohexane]-2-yl; spiro[3-(2,2-dichloroethenyl)cyclopropane-1,1'-cyclobutane]-2-yl; 3-phenyl-2,2-dimethylcyclopropyl; 3-(4-halophenyl)-2,2-dimethylcyclopropyl; 3-(4-methoxyphenyl)-2,2-dimethylcyclopropyl; 3-(4-ethoxyphenyl)-2,2-dimethylcyclopropyl; and 3-(3,4-methylenedioxyphenyl)-2,2-dimethylcyclopropyl.

4,493,845

ANTIBIOTIC AM-3603

Satoshi Omura, Tokyo; Yoshitake Tanaka, Machida; Yuzuru Iwai, Narita; Yoko Takahashi, Tokyo, and Akira Nakagawa, Fuchu, all of Japan, assignors to Kitasato Kenkyusho, Tokyo, Japan

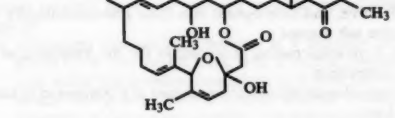
Continuation-in-part of Ser. No. 298,695, Sep. 2, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,818

Claims priority, application Japan, Sep. 5, 1980, 55-123283

Int. Cl.³ C07D *491/08*

U.S. Cl. 424—279 **7 Claims**

1. A substance designated as AM-3603 having antibiotic activity represented by the following formula:

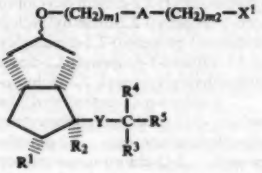


4,493,846
BICYCLOOCTANE DERIVATIVES

Keiichi Ono, Osaka; Akihiko Sugie, Toyonaka; Hajime Kawakami, Takarazuka; Shunsuke Sami, Toyonaka; Atsuyuki Kojima, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 13, 1981, Ser. No. 243,570
Claims priority, application Japan, Mar. 21, 1980, 55/36720; Jul. 8, 1980, 55/93664
Int. Cl.³ C07C 69/608, 69/616, 61/13, 61/28
U.S. Cl. 424—308 20 Claims

1. A compound of the formula



wherein

X^1 is COOH, C_1–C_4 alkoxycarbonyl, phenoxycarbonyl, phenylalkyloxycarbonyl, (C_1–C_4 alkoxy)methoxycarbonyl, (C_2–C_5 alkanoyloxy)methoxycarbonyl, (C_3–C_7 cycloalkyloxy)carbonyl, phenylcarbonylmethoxycarbonyl, or (hydroxy C_1–C_4 alkoxy)carbonyl,

Y is ethylene or vinylene,

R^1 is —H, —OH, —OC_1–C_4 alkanoyl, —O—benzoyl, or —O—(C_1–C_4 alkoxy)alkyl,

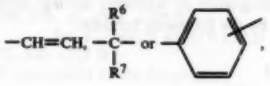
R^2 is H or R^1 or R^2, when taken together, are a single linkage forming a double bond between the carbon atoms to which they are linked,

R^3 is OH, —OC_1–C_4 alkanoyl, —O—benzoyl, or —O(C_1–C_4 alkoxy)alkyl,

R^4 is H or C_1–C_4 alkyl,

R^5 is H, C_3–C_8 alkenyl, C_3–C_8 alkynyl, C_1–C_8 alkyl, C_3–C_7 cycloalkyl or a group of the formula —$(CH_2)_n$—B where n is 1 or 2 and B is C_1–C_4 alkoxy, C_3–C_7 cycloalkyl, phenyl, phenoxy, phenyl substituted with any of a halogen atom, C_1–C_4 alkyl, CF_3, or C_1–C_4 alkoxy; or phenoxy substituted with any of a halogen atom, C_1–C_4 alkyl, CF_3, or C_1–C_4 alkoxy;

A is



wherein

R^6 and R^7 are each independently H or C_1–C_4 alkyl;

m_1 is 1 or 2, and

m_2 is 0, 1 or 2, and

an effective, anti-ulcerogenic non-toxic pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition for the treatment of ulcers comprising

an anti-ulcerogenic effective amount of a compound of claim 1 and

a pharmaceutically acceptable carrier or diluent.

4,493,847
FAT EMULSION CONTAINING PROSTAGLANDIN E_1 AND METHOD FOR PRODUCTION THEREOF

Yutaka Mizushima, Tokyo; Hironaka Aihara, Kitamoto; Susumu Otomo, Konosu; Kazumasa Yokoyama, Toyonaka; Hiroyuki Okamoto, Akashi, and Tadakazu Suyama, Kyoto, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo and The Green Cross Corporation, Osaka, both of, Japan

Filed Jun. 13, 1983, Ser. No. 503,599
Claims priority, application Japan, Jun. 18, 1982, 57-104814
Int. Cl.³ A61K 31/19
U.S. Cl. 424—317 13 Claims

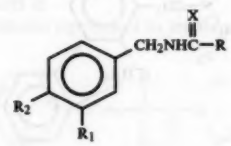
1. A fat emulsion containing prostaglandin E, which comprises 5–50%(W/V) of soybean oil, an effective amount of prostaglandin E_1, 1–50 parts by weight of a phospholipid for 100 parts by weight of the soybean oil, and a proper amount of water.

4,493,848
COMPOSITIONS AND METHODS USEFUL FOR PRODUCING ANALGESIA

Thomas R. LaHann, Cleves, Ohio, and Brian L. Buckwalter, Yardley, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 14, 1983, Ser. No. 514,206
Int. Cl.³ A61K 31/165
U.S. Cl. 424—324 14 Claims

1. A method for producing analgesia in humans or lower animals, which comprises administering to said human or lower animal a safe and effective amount of a monoalkenamide compound or pharmaceutically-acceptable salt thereof, or mixtures thereof, of the formula:



wherein X is O or S; R is straight or branched, cis-monounsaturated alkenyl having from 11 to 23 carbon atoms; R_1 is H, OH, or OCH_3; R_2 is OH, or a short-chain ester; and wherein at least one of R_1 and R_1 is OH or OCH_3.

4,493,849
PROCESS FOR PREPARING A NON-CHALKY, ORGANOLEPTICALLY PLEASING CHEWING GUM COMPOSITION

Thomas J. Carroll, Astoria; Michael Rubin, West Nyack; Dominic J. Piccolo, Brooklyn, all of N.Y., and Michael Glass, Fairlawn, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 21, 1983, Ser. No. 544,330
Int. Cl.³ A23G 3/30
U.S. Cl. 426—3 19 Claims

1. The process of making a non-chalky organoleptically pleasant chewing gum composition which comprises:

(a) forming a premix comprising particulate lecithin present in the amount of about 2 to about 7%, and an agglomerated mixture of dicalcium phosphate dihydrate and a sweetener, said dicalcium phosphate dihydrate being present in the amount of about 50 to about 70% and said sweetener being present in the amount of about 25 to about 30%, all percents being based on the total weight of the premix;

(b) mixing the premix of (a) with an effective amount of corn syrup, coloring agent and additional sweetener;

(c) further mixing the resultant mixture of (b) with a gum base to obtain a homogeneous mass.

4,493,850

METHOD OF TREATING AND CONSERVING FILLED DOUGH FOOD PRODUCTS

Mario Fioravanti, Via Zuccoli, 26, Milano, Italy

Continuation of Ser. No. 444,435, Nov. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 202,707, Oct. 31, 1980, abandoned. This application May 11, 1984, Ser. No. 608,935

Int. Cl.³ A21D *6/00, 15/04;* A23L *1/10*

U.S. Cl. 426—283 3 Claims

1. A method of treating and preserving filled dough products in the form of filled dough shells selected from the group of ravioli, tortellini, cappelletti and canelloni, which comprises the steps of subjecting filled dough shells to a high moisture environment at a high temperature, ranging from 70° C. to 100° C. range to provide surface gelling, subsequently drying the shells until the dough thereof reaches a moisture content level of 23 to 28 percent to prevent crumbling of the dough shells, packaging said dried dough shells under vacuum, and subjecting said packaged filled dough shells to a high temperature in the 70° C. to 100° C. range for a predetermined period of time sufficient to preserve the filled dough shells.

4,493,851

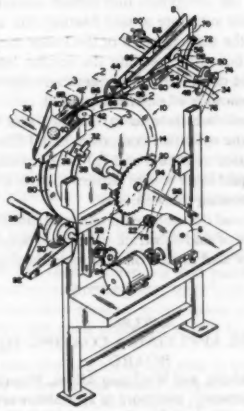
METHOD FOR SEPARATING THE PULP FROM THE SKIN OF TOMATOES

Jesus A. Silvestrini, Mendoza, Argentina, assignor to IMDEC S.R.L., Mendoza, Argentina

Division of Ser. No. 253,373, Apr. 13, 1981, Pat. No. 4,355,572. This application Aug. 23, 1982, Ser. No. 410,248

Int. Cl.³ A23N *7/00*

U.S. Cl. 426—482 7 Claims



1. A method of separating pulp from the skin of tomatoes, comprising the steps of

gripping the outer surface of said skin on opposite sides of a plane extending generally through said fruit, by a pair of generally opposed, resiliently deflectable members;

carrying said fruit around at least a portion of a continuously circular path;

then producing a cut through a portion of said skin remote from said gripping contact and in a plane extending generally through said fruit; and

urging said pulp away from said gripped skin through said cut in said skin by the centrifugal force imparted by said movement around said continuously circular path, whereby the pulp is separated from the skin.

4,493,852

1,1-BIS (THIOALKYL) ALKYL-2,4-DIENE AS A FLAVORING AGENT

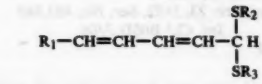
Paul R. Zanno, Hopewell Junction; Thomas H. Parliment, New City; Robert J. Soukup, New City, and Richard P. McNaught, New City, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 304,394, Sep. 21, 1981, abandoned. This application Apr. 20, 1984, Ser. No. 602,095

Int. Cl.³ A23L *1/231*

U.S. Cl. 426—535 6 Claims

1. A foodstuff selected from a group consisting of soup, meat and stuffing mix comprising an amount of a flavoring compound within the range of 0.1 to 100 part ppm of the foodstuff, said flavoring compound having the following structure:



wherein R_1 is an alkyl group of 1 to 7 carbon atoms; and R_2 and R_3 are an alkyl group of 1 to 3 carbon atoms.

4,493,853

CHOCOLATE PRODUCTS WITH INCREASED PROTEIN CONTENT AND PROCESS FOR THE PRODUCTION OF SUCH TYPE PRODUCTS

Gábor Vajda; László Ravasz; Béla Karácsonyi, and Gábor Tabajdi, all of Budapest, Hungary, assignors to Központi Váltó- és Hitelbank RT. Innovációs Alap, Budapest, Hungary

Filed Jan. 31, 1983, Ser. No. 462,726

Claims priority, application Hungary, Feb. 1, 1982, 289/82

Int. Cl.³ A23G *1/00*

U.S. Cl. 426—582 12 Claims

1. A process for the preparation of a chocolate product with increased protein content, which comprises the steps of:

(a) melting and processing cheese,

(b) mixing said melted processed cheese with a quickly melted chocolate melt in a ratio of 1:1–1.5,

(c) homogenizing the resulting mass with vigorous stirring at 50 degrees Centigrade or higher,

(d) optionally adding granulous substance to said homogenized mass,

(e) allowing the homogenized mass rapidly to solidify to a product, and

(f) finally immersing the product in chocolate or plain chocolate mass.

4,493,854

PRODUCTION OF DEFATTED SOYBEAN PRODUCTS BY SUPERCRITICAL FLUID EXTRACTION

John P. Friedrich, Green Valley, and Arthur C. Eldridge, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 20, 1983, Ser. No. 534,015

Int. Cl.³ A23L *1/20;* C11B *1/10*

U.S. Cl. 426—629 12 Claims

1. A method for preparing a flavorful, defatted soybean protein product from raw soybean material comprising the steps of:

a. contacting said soybean material at a moisture content above 6.5% dry weight basis with a carbon dioxide solvent under supercritical conditions such that the characteristic raw grassy flavor is reduced without a substantial reduction in the protein solubility, wherein said conditions include a pressure of at least 690 bar and a temperature of

at least 81° C., and thereby extracting the lipids from said soybean material;

b. separating the lipid-containing carbon dioxide solvent resulting from step (a) from a substantially lipid-free soybean residue; and

c. recovering said residue as a nutritious, organoleptically acceptable product characterized by a substantially reduced raw grassy flavor as compared to that of the raw soybean material.

4,493,855

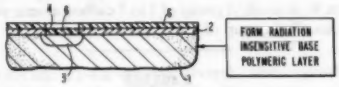
USE OF PLASMA POLYMERIZED ORGANOSILICON FILMS IN FABRICATION OF LIFT-OFF MASKS

Harbans S. Sachdev, and Krishna G. Sachdev, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,549

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—41 **6 Claims**



1. A method for forming a patterned metal coating on an oxidized monocrystalline silicon substrate having at least one via hole in said oxide to expose surface adjacent portions of said substrate, and with said substrate having at least one integrated circuit formed therein in electrical communication with said via hole, comprising:

A. blanket depositing a first film of a solvent soluble organic polymer over the oxidized surface and said exposed portions of said substrate, with said first polymeric film being subject to reactive ion etching in an oxygen containing ambient;

B. plasma polymerizing over said first film a second oxygen barrier film of an organosilicon polymer film, with said second film being subject to etching in a fluorine containing ambient;

C. heat treating said second film for about 10 to about 30 minutes at a temperature in the range of about 85° C. to about 300° C. to cross-link said second film,

D. depositing over said second film a resist layer subject to etching in an oxygen containing ambient, including exposing and developing said resist to form a pattern of openings at least one of which is in register with a corresponding one of said via holes, and expose therebetween the corresponding portions of said second film;

E. reactive ion etching in a fluroine containing ambient the exposed portions of said second to replicate said pattern of openings in said second film and expose corresponding portions of said first film;

F. reactive ion etching in an oxygen containing ambient the said exposed portions of said first film to replicate said pattern of openings through said first film and remove said resist from remaining portions of said second film whereby said second film is treated by an oxygen plasma;

G. depositing a blanket coating of a conductive film on said substrate inclusive of said openings over said substrate; and

H. subjecting composite structure to said solvent to solvate said polymeric first film and concurrently lifting-off all superimposed films thereon so as to retain said metal film on the said exposed portions of said substrate.

4,493,856

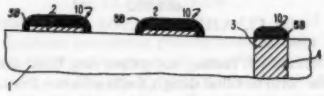
SELECTIVE COATING OF METALLURGICAL FEATURES OF A DIELECTRIC SUBSTRATE WITH DIVERSE METALS

Ananda H. Kumar, and Kris V. Srikrishnan, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,469

Int. Cl.³ B05D *3/00, 3/02, 3/12, 5/00*

U.S. Cl. 427—57 **19 Claims**



1. A method for selectively depositing brazeable and solderable coatings over an existing metallurgical pattern on surfaces of a dielectric substrate comprising:

(A) sequentially blanket coating said substrate, inclusive of said pattern, with two discrete levels of diverse metals having a differential in melting points and forming alloy systems of said metals with alloys thereof brazeable and solderable, bondable to said pattern, and non-wetting to the bare surfaces of said substrate wherein said diverse metals form a continuous series of solid solutions whose solidus curve lies intermediate the melting points of the substantially pure component metals, said blanket coating carried out so that the metal having the lower melting point is disposed adjacent said substrate, and using a thickness of the deposited metals that in conjunction with the heating rate of subsequent step (B) allows formation of a temporary liquid layer next to the substrate surface at or below the peak heat treatment temperature while the top portions of the composite film remain unmolten;

(B) heating said substrate at said heating rate to a temperature above the melting point of the lower melting component metal but not exceeding the solidus temperature of any resultant completely homogenized alloy corresponding to the amounts of metals deposited;

(C) cooling said substrate to (a) solidify said liquid layer, delaminate the solidified composite metal film on the bare surfaces of said substrate and (c) concurrently bond said solidified liquid layer to said pattern to form a brazeable or solderable coating thereon; and

(D) removing said delaminated composite film from the bare surface areas of said substrate to retain a bonded cladding comprised of said metals on said metallurgical pattern.

4,493,857

METHOD FOR APPLYING A COATING TO A THIN BOARD

Rolf Knigge, Hamburg, and Wolfgang Albien, Pinneberg, both of Fed. Rep. of Germany, assignors to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Hamburg, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,813

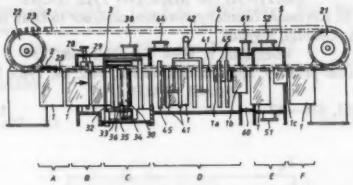
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149588

Int. Cl.³ B05D *1/28*

U.S. Cl. 427—96 **4 Claims**

1. A method for applying a coating to the surface of a thin rigid board and subsequently drying the coating, comprising bringing the board in a vertical position and affixing one edge of it to conveying means; conveying and treating said board in a vertical position in a coating unit and a subsequent drying unit, and compensating any pressure and heating directed to one vertical surface of said board by equal pressure and heating

directed to the opposite surface by providing pressure means and heating means symmetrically on both sides of the path of



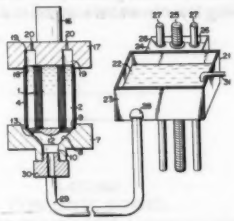
said board so that a plane and vertical position of the surface is substantially maintained during treatment.

4,493,858

METHOD FOR INSULATING SLOTS IN ROTORS OF ELECTRICAL ROTATING MACHINES

Hiroshi Nishizawa; Tadayuki Sato, and Takashi Ishikawa, all of Mie, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 428,331
Claims priority, application Japan, May 26, 1982, 57-89169
Int. Cl.³ B05D 5/12
U.S. Cl. 427—104 **10 Claims**



1. A method for insulating slots in a rotor of an electrical rotating machine, said rotor comprising a rotor core assembly formed of laminated rotor punchings each having said slots, said method comprising the steps of:

removing punching oil from the inner surface of said rotor core assembly by heating only the interior of said slots to a high temperature while axially compressing said rotor core assembly;

applying a liquid electric insulating paint to the inner wall surfaces of said slots by introducing said paint only into said slots and then discharging said paint from said slots while axially compressing said rotor core assembly;

applying a negative pressure to the lower ends of said slots to remove said paint collected at said lower ends of said slots; and

heating at least the interior of said slots to bake said paint on the inner wall surfaces of said slots.

4,493,859

METHOD FOR MARKING HOT PIPE

Robert J. Krantz, Hermitage, Pa., assignor to Cyclops Corporation, Sharon, Pa.

Filed Sep. 13, 1982, Ser. No. 417,546
Int. Cl.³ B05D 1/12
U.S. Cl. 427—193 **6 Claims**

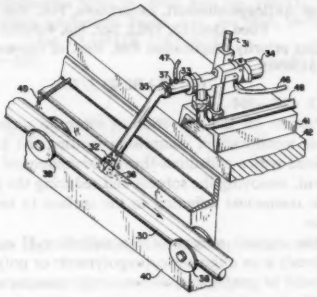
1. A method of marking a hot metal workpiece using glass particles having a melting point comprising the steps of:

(a) providing a hot metal workpiece covered with mill scale and at a temperature not less than the melting point of the glass particles,

(b) identifying a place on said work piece to be marked,

(c) applying a controlled flow of the glass particles to the place on the hot metal workpiece,

(d) allowing the particles to melt and produce a fusion coating on the place on the workpiece which coating absorbs mill scale, and



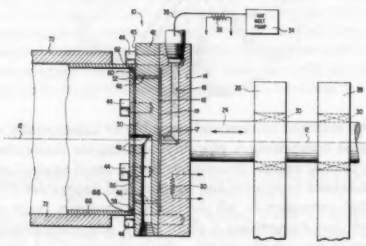
(e) cooling the workpiece at least until the coating cracks and at least a portion of the coating falls off the workpiece thereby removing the mill scale from that portion of the workpiece covered by the fallen portion of the coating and leaving bare metal.

4,493,860

APPLYING AN ADHESIVE STRIP TO A CONTAINER INTERIOR

Kevin M. Callahan, Rockledge, Pa., assignor to International Paper Company, New York, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,103
Int. Cl.³ B05D 7/22
U.S. Cl. 427—230 **6 Claims**



5. A method of affixing an annularly continuous strip of adhesive to the interior rim or edge of an open ended container, the method including the steps of placing the rim of the open end of the container against a flat abutment surface, moving a mass of an adhesive radially outwardly along an annularly continuous channel until the adhesive strikes the interior surface of the container adjacent said edge, causing the adhesive to then flow in a generally axial direction along a portion of the interior surface of the container, whereby an annularly continuous strip or band of adhesive of uniform radial thickness is formed on the container wall interior.

4,493,861

PROCESS FOR ACTIVATING SUBSTRATE SURFACES FOR CURRENTLESS METALLIZATION

Kirkor Sirinyan, Leverkusen; Henning Giesecke, Cologne; Gerhard D. Wolf, Dormagen; Harold Ebneth, and Rudolf Merten, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,043

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150985

Int. Cl.³ B05D *3/10*

U.S. Cl. 427—304 8 Claims

1. Process for the activation of substrate surfaces for currentless metallization, comprising wetting the surface to be metallized with a palladium-II organic compound dissolved in a solvent, removing the solvent and reducing the palladium-II organic compound adhering to the surface to be metallized, wherein

(a) the organic moiety of the palladium-II organic compounds is an oligomeric, prepolymeric or polymeric compound of conjugated dienes or an unsaturated polyester and

(b) the complex is formed by reaction of organic metallic compounds with said oligomeric, prepolymeric or polymeric compound, said reaction being accompanied by ligand exchange.

4,493,862

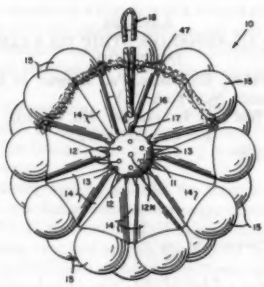
ORNAMENTAL ASSEMBLY AND METHOD

James C. Allbert, and Helen M. Allbert, both of 151 Pleasant View Rd., Derby, Conn. 06418

Filed Feb. 24, 1984, Ser. No. 582,391

Int. Cl.³ A41G *1/04;* A47G *33/00*

U.S. Cl. 428—10 20 Claims



1. An enlarged ornamental assembly of substantially spherical shape comprising a plurality of elongate decorative elements having similar dimensions and a small central support core designed to receive and support said decorative elements in radial extension in all directions therefrom, said central support core comprising a plurality of geometrically-located retainer means which extend radially thereto in all directions and which are substantially-uniformly spaced over the surface of said core, said elongate decorative elements each comprising a hollow conical body portion having a narrow attachment end received and supported in radial extension by a said retainer means of said core, and an enlarged decorative end spaced from said attachment end adjacent the frustrum of the conical body portion, there being a sufficient number of retainer means and elongate decorative elements to support enough decorative ends of sufficient dimensions to provide an enlarged decorative sphere surface comprising said decorative ends closely-spaced from or contacting each other to substantially completely hide the small central support core.

4,493,863

CAMOUFLAGE MATERIAL WITH PARTIAL APERTURES FORMING CURLED TONGUES AND METHOD OF MAKING THE SAME

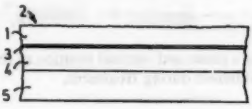
Lars G. Karlsson, Gamleby, Sweden, assignor to Diab Barracuda AB, Laholm, Sweden

Filed Jan. 6, 1984, Ser. No. 568,733

Claims priority, application Sweden, Jan. 14, 1983, 8300175

Int. Cl.³ F41H *3/00*

U.S. Cl. 428—17 13 Claims



1. Camouflage material in the form of a three-dimensional camouflage-coloured apertured sheet, characterized in that there is included in the sheet a supporting layer on which there is laminated a layer of a plastics material initially having internal tensional stresses, said sheet having variously oriented, unconnected, curved slits going through the sheet, the slits forming apertures in said sheet and forming tongues which, due to the action of the internal tensional stresses in said plastics material that are activated when said sheet is slitted, are curled outwards from the general plane of the sheet away from the supporting layer to which said plastics material is secured.

4,493,864

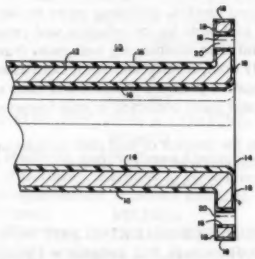
COATED PIPE AND METHOD OF MAKING SAME

Ian D. M. Thomson, Plumsteadville, Pa., assignor to Arbonite Corporation, Doylestown, Pa.

Filed Jul. 1, 1982, Ser. No. 394,092

Int. Cl.³ B32B *7/02, 15/00;* D03D *49/06*

U.S. Cl. 428—36 2 Claims



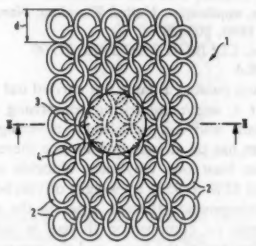
1. A protectively coated flanged pipe comprising a pipe section and at least one flange section, wherein the surface of said pipe section is coated with a first relatively lower durometer protective resin coating and, the surface of said flange section is coated with a second relatively higher durometer protective resin coating said pipe is composed of carbon or stainless steel and said protective coatings are PVC wherein the durometer of said first coating is about 45–80 shore A and the durometer of said second coating is about 86–94 shore A.

4,493,865

PROTECTIVE MITTEN MADE OF METAL RING FABRIC

Gerhard Kuhlmann; Gerhard Schleihauf, and Emil Brandauer, all of Mühlacker, Fed. Rep. of Germany, assignors to Friedrich Munch GmbH & Co. K.G., Mühlacker, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 541,995
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1982, 3238499
Int. Cl.³ D04B 1/28
U.S. Cl. 428—52 29 Claims



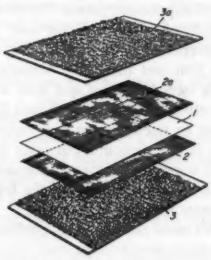
1. In a protective mitten comprising a metal ring fabric, the improvement residing in that said fabric comprising at least one portion which is embedded in elastomeric material and at least one area which is free of elastomeric material.

4,493,866

COSMETIC TOWEL

Yoon H. Kim, 19812 50th W. #614, Lynnwood, Wash. 98036

Filed Nov. 1, 1983, Ser. No. 547,570
Int. Cl.³ A47L 17/00; B32B 7/04
U.S. Cl. 428—101 7 Claims



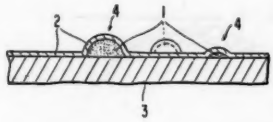
1. A cosmetic towel or the like comprising:
a planar piece of smooth, slick fabric,
two pieces of gauze-like material, one of each of said two pieces of gauze-like material being layered on each side of said smooth fabric, and
two pieces of towel, one each of said two pieces of towel being layered on each side of said gauze-like material, said layers of smooth fabric, gauze-like material and towel being stitched together around the edges with sewing thread or the like, the arrangement being such that each of the gauze layers is in movable relationship with the face of the smooth fabric with which it is superposed.

4,493,867

STRETCH FILM FOR WRAPPING AND A RESIN COMPOSITION THEREFOR

Takao Yazaki, and Masataka Noro, both of Mie, Japan, assignors to Mitsubushi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 143,260, Apr. 24, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,731
Claims priority, application Japan, Apr. 24, 1979, 54-49801
Int. Cl.³ B32B 3/30, 27/06
U.S. Cl. 428—161 13 Claims



1. A stretch film comprising a resin composition composed of
(A) a resin selected from the group consisting of (i) an ethylene-vinyl acetate copolymer resin having a vinyl acetate content of from about 5 to 25% by weight and (ii) a polybutadiene resin,
(B) a binder, and
(C) a lubricant, wherein the strecth film has a surface structure such that particles of binder (B) are scattered on the surface of the film layer composed of resin (A) containing residual amounts of binder (B) and lubricant (C) which do not migrate to the surface and the surface of the film layer and the entire surface of the particles of binder (B) are covered by lubricant (C) to form convex protubernances having a diameter of from 0.1 to 5μ and wherein the stretch film has a static friction coefficient of not more than 0.55 and an adhesive strength of not less than 200 g/2 cm^2.

4,493,868

HIGH BULK BONDING PATTERN AND METHOD

Gary H. Meitner, Winneconne, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 330,288, Dec. 14, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,502
Int. Cl.³ B32B 5/14
U.S. Cl. 428—171 23 Claims

1. A high-loft nonwoven material having a basis weight in the range of from about 2 oz/yd to about 6 oz/yd comprising a web of thermoplastic filaments having an irregular and essentially nonrepeating pattern of bond areas of varying bond sizes and densities comprising a combination of bond patterns resulting in an average bond density of at least 40 bonds per square inch and an average total bond area percent coverage less than 40%.

4,493,869

FRAGRANCE-RELEASING MICROCAPSULES ON A SEE-THROUGH SUBSTRATE

Norman P. Sweeny, North Oaks, Minn.; Keith E. Relyea, St. Joseph, Wis., and Wayne L. Brustad, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 11, 1983, Ser. No. 540,502
Int. Cl.³ B32B 5/16
U.S. Cl. 428—201 10 Claims

1. A fragrance releasing article comprising:
(A) a transparent or translucent organic polymeric carrier layer,
(B) on one side of said carrier layer a pressure-sensitive or water-moistenable adhesive layer, and
(C) on the other side of said carrier layer a printed image applied to said carrier layer, and
(D) a non-opacifying fragrance releasing layer comprising

microcapsules carrying a volatile, fragrant liquid therein and an organic binder resin adhering the microcapsules to the printed carrier layer.

4,493,870

FLEXIBLE LAYERED PRODUCT

Cornelius M. F. Vrouenraets, Dieren, and Doetze J. Sikkema, Ellecom, both of Netherlands, assignors to Akzo nv, Arnhem, Netherlands

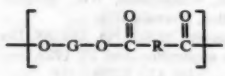
Filed Dec. 1, 1983, Ser. No. 556,999

Claims priority, application Netherlands, Dec. 2, 1982, 8204675

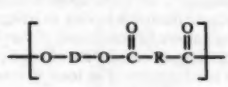
Int. Cl.³ B32B 7/00

U.S. Cl. 428—245 9 Claims

1. Flexible layered product for use in waterproof garments or tents of a textile material covered with a waterproof material having a water vapour transmission rate of at least 1000 g/m² day, characterized in that the textile material is covered with a film of a copolyether ester consisting of a plurality of recurrent intralinear long-chain ester units and short-chain ester units which are randomly joined head-to-tail through ester bonds, said long-chain ester units corresponding to the formula:



said short-chain ester units corresponding to the formula:



where G is a divalent radical remaining after removal of terminal hydroxyl groups from at least one long-chain glycol having a molecular weight in the range of 800 to 6000 and an atomic ratio of carbon to oxygen in the range of 2.0 to 4.3, at least 70% by weight of the long-chain glycol having a carbon to oxygen ratio in the range of 2.0 to 2.4, R is a divalent radical remaining after removal of carboxyl groups from at least one carboxylic acid having a molecular weight less than 300, and D is a divalent radical remaining after removal of hydroxyl groups from at least one diol having a molecular weight less than 250, at least 80 mole % of the dicarboxylic acid used consisting of terephthalic acid or the ester forming equivalents thereof and at least 80 mole % of the low molecular weight diol consisting of 1,4-butanediol or the ester forming equivalents thereof, the sum of the mole percentages of the dicarboxylic acid which is not terephthalic acid or the ester forming equivalents thereof and of the low molecular weight diol which is not 1,4-butanediol or the ester forming equivalents thereof is not higher than 20 and the short-chain ester units form 50–75% by weight of the copolyether ester.

4,493,871

RESILIENT POLYURETHANE FOAM WITH IMPROVED RESISTANCE TO IGNITION

Peter G. Edgerley, and Sidney R. D. Oldland, both of Welwyn Garden City, England, assignors to Imperial Chemical Industries PLC, England

Continuation of Ser. No. 304,053, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 207,706, Nov. 17, 1980, abandoned, and a continuation-in-part of Ser. No. 260,840, May 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 207,706, Nov. 17, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 456,727

Claims priority, application United Kingdom, Nov. 12, 1980, 8036318; Sep. 3, 1980, 8028397

Int. Cl.³ B32B 3/06, 3/26, 27/00

U.S. Cl. 428—308.4 8 Claims

1. A combination passing a flame test carried out according to BS 5852: Part 1, said combination comprising a resilient polyurethane foam and an upholstery covering material wherein said foam has on at least one surface thereof at least one coating of at least one vinylidene shloride copolymer containing at least 82% to 95% by weight of vinylidene chloride units, or a composition thereof, wherein the vinylidene chloride copolymer or composition thereof is substantially absent from the interior of the foam, and the amount of chlorine in the at least one vinylidene chloride copolymer or composition thereof is at least 60% by weight based on the weight of the at least one vinylidene chloride copolymer.

4,493,872

POLYESTER FILM COATED WITH METAL ADHESION PROMOTING COPOLYESTER

F. Gene Funderburk, Taylors; E. C. Culbertson, Greer, and Robert G. Posey, Taylors, all of S.C., assignors to American Hoechst Corporation, Somerville, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,126

Int. Cl.³ B32B 15/08, 27/08, 27/36

U.S. Cl. 428—332 26 Claims

1. An oriented self-supporting plastic film having a continuous copolyester polymeric coating on one or both sides thereof, said film prepared by melt extruding a substantially amorphous plastic film and thereafter orienting the film by stretching in one or two directions and heat setting the film, said copolyester coating being applied to said film as an aqueous dispersion prior to stretching in one direction or subsequent to stretching in one direction but prior to stretching in two directions, said copolyester coating consisting essentially of the polyester condensation product of the following monomers or their polyester forming equivalents:

(A) about 65 to 95 mole percent of isophthalic acid;

(B) about 0 to 30 mole percent of at least one aliphatic dicarboxylic acid of the formula $HOOC(CH_2)_nCOOH$, wherein n ranges from about 1–11;

(C) about 5 to about 15 mole percent of at least one sulfomonomer containing an alkali metal sulfonate group attached to a dicarboxylic aromatic nucleus; and

(D) stoichiometric quantities of about 100 mole percent of at least one copolymerizable aliphatic or cycloaliphatic alkylene glycol having about from 2 to 11 carbon atoms,

said film exhibiting improved adhesion to a metal coating applied by vapor deposition techniques onto one or both of said copolyester coated sides.

2. The film of claim 1 wherein said copolyester coating has a dry thickness within the range of about 10^{-7} to about 10^{-5} inch.

4,493,873

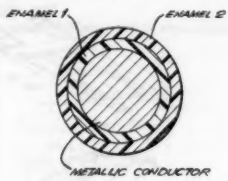
CORONA-RESISTANT WIRE ENAMEL COMPOSITIONS AND CONDUCTORS INSULATED THEREWITH

John J. Keane, Ballston, and Denis R. Pauze, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 374,844, May 5, 1982,. This application Mar. 30, 1983, Ser. No. 480,627

Int. Cl.³ B32B 9/00, 15/00, 27/00; H01B 7/00

U.S. Cl. 428—372 3 Claims



1. An electrical conductor insulated with corona-resistant two-stage insulation system comprising: a first insulating layer disposed peripherally around said conductor formed of a cured polyester, polyamideimide or polyesterimide resin; and a second insulating layer disposed peripherally around said first layer formed of a cured polyamide resin, wherein the resins forming said first and second layers are different, and wherein either said first layer or said second layer further comprises from about 1% to about 35% by weight of alumina particles of a finite size of less than approximately 0.1 micron, disposed within said resin by high shear mixing.

4,493,874

PRODUCTION OF A MAGNETIC POWDER HAVING A HIGH DISPERSIBILITY

Osamu Kubo, Yokohama; Tadashi Ido, Ebina; Tutomu Nomura, Yokohama, and Tatsumi Maeda, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 8, 1983, Ser. No. 473,200

Int. Cl.³ C04B 35/26

U.S. Cl. 428—403 10 Claims

1. A method for manufacturing a hexagonal ferrite magnetic powder for high density magnetic recording comprising:

melting a mixture of hexagonal ferrite-forming components and a glass-forming component;

rapidly cooling the resultant molten mixture to obtain an amorphous material;

thermally treating the amorphous material to precipitate fine particles of the magnetic hexagonal ferrite therein; and

dissolving the amorphous material containing the precipitated fine particles such that a glass matrix of the glass-forming component remains on each of said fine particles in an amount of 0.01 to 0.3% by weight based on the weight of the particles, to obtain the hexagonal ferrite magnetic powder having a particle size of 0.01–0.3 μm, said hexagonal ferrite magnetic powder when mixed with a paint and coated on a non-magnetic base material effecting a recording medium that exhibits a higher squareness ratio and/or a higher surface gloss than a recording medium having coated thereon said hexagonal ferrite magnetic powder containing either less than 0.01 or more than 0.3% by weight of said glass matrtix.

4,493,875

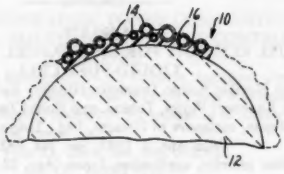
PROPPANT FOR WELL FRACTURES AND METHOD OF MAKING SAME

Warren R. Beck, and Richard B. Castle, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 9, 1983, Ser. No. 559,965

Int. Cl.³ B32B 1/00, 3/14, 7/02

U.S. Cl. 428—403 18 Claims



1. A composite particle which is useful as a proppant and comprises

(a) a high-strength core having a density of at least 2.2 g/cc, and

(b) a thin void-containing coating of a density less than 0.8 g/cc, which composite particle has an overall average diameter from 0.2 to 3 mm.

4,493,876

CORROSION INHIBITION

Kevin Birkett; Edward G. Scovell, both of Manchester, and Glyn R. John, Warrington, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 16, 1984, Ser. No. 600,383

Claims priority, application United Kingdom, May 4, 1983, 8312211; Jan. 31, 1984, 8402491

Int. Cl.³ C09D 5/08

U.S. Cl. 428—457 8 Claims

1. A process for the inhibition of corrosion of metals selected from the group consisting of iron, zinc, copper, tin and aluminium which comprises treating the metal with a 2-hydroxy-5-alkylbenzaldoxime wherein the 5-alkyl substituent contains from 7 to 13 carbon atoms and wherein the benzaldoxime ring is unsubstituted or carries a substitutent selected from the group consisting of halogen and nitro.

4,493,877

SUPPORT MEMBER

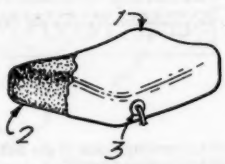
John S. Burnett, 51 Coldharbour La., Bushey, Herts., England

Filed Feb. 5, 1981, Ser. No. 231,829

Claims priority, application United Kingdom, Feb. 7, 1980, 8004084; Mar. 14, 1980, 8008654

Int. Cl.³ A47C 13/00

U.S. Cl. 428—542.8 7 Claims



1. In a device for conforming to the shape of and for supporting a body, comprising an airtight bag containing a granular material, means enabling the bag to be maintained in an evacuated condition, the bag and the material therein being so arranged that when the bag is not evacuated the granular material will flow to allow the bag to assume a shape conforming to

the shape of a body to be supported and that when the bag is subsequently evacuated the granular material forms a rigid support in the conformed shape by virtue of compression of the particles against one another, the improvement that the granular material has a surface which can be rendered adhesive whereby, when in said conformed shape, the granules adhere to one another to form a permanently rigid structure in said conformed shape independently of maintenance of the evacuated condition.

4,493,878

FUEL ELEMENT FOR LIQUID FUEL CELL AND A LIQUID FUEL CELL

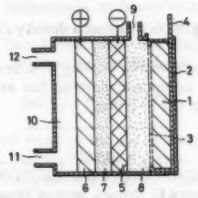
Tatsuo Horiba; Kazuo Iwamoto; Hidejiro Kawana, all of Hitachi; Kazunori Fujita, Tohkai, and Kohki Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,723

Claims priority, application Japan, Apr. 23, 1982, 57-67416

Int. Cl.³ H01M *6/36, 8/04*

U.S. Cl. 429—12 **18 Claims**



1. A fuel element for supplying liquid fuel to a fuel cell comprising: a non-fluid material binding a fuel in a non-fluidized state within an outer wrapping or cartridge, whereby the fuel element may be removably positioned within a fuel cell to provide liquid fuel to the fuel cell.

4,493,879

FUEL CELL

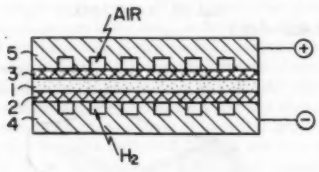
Toshiki Kahara; Shimpei Matsuda, both of Ibaraki; Kenzo Ishii, Hitachi; Seizi Takeuchi, Hitachiota; Jinichi Imahashi, and Akio Houji, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,278

Claims priority, application Japan, Mar. 18, 1981, 56-37844; Mar. 18, 1981, 56-37845; Mar. 18, 1981, 56-37846

Int. Cl.³ H01M *4/86*

U.S. Cl. 429—41 **8 Claims**



1. In a fuel cell comprising a pair of gas diffusion electrodes and a matrix retaining phosphoric acid electrolyte, disposed between said gas diffusion electrodes, the improvement wherein said matrix comprises one or more metal oxides being electron-insulative and insoluble in phosphoric acid for enlarging the retention of phosphoric acid within said matrix and one or more polymeric binders, wherein the one metal oxide is a complex oxide containing zirconium and selenium, phosphorus, or silicon.

4,493,880

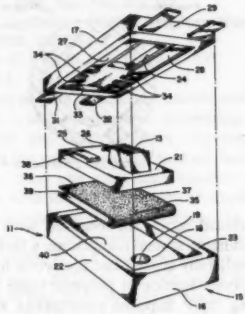
BATTERY SWITCH

Jeffrey S. Lund, Roseville, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 19, 1983, Ser. No. 562,953

Int. Cl.³ H01M *2/20*

U.S. Cl. 429—97 **9 Claims**



1. A switch for use in controlling operation of a metal-air battery having air-depolarizable cells, means for housing the cells, and terminals connected to the cells, said switch comprising:

wall means defining a vent opening for admitting air to the battery cells in the housing;

a slide;

means for guiding the slide for movement in a preselected path adjacent said wall means;

electrical switch means constructed to be closed as a result of said slide being disposed in a first position in said path and open as a result of said slide being disposed in a second position in said path;

means for connecting said switch means to the battery cell terminals;

a flexible closure; and

means for causing the closure to be sealed to said wall means across said vent opening when the slide is in said second position, and opening said vent opening and thereby permitting air flow through said vent opening as a result of movement of the slide from said second position to said first position.

4,493,881

ELECTROPHOTOGRAPHIC METHOD FOR PRODUCING BLACK AND COLOR SEPARATION IMAGES

John D. Mitchell, Webster, and Stephen Michel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1983, Ser. No. 506,255

Int. Cl.³ G03G *13/01*

U.S. Cl. 430—42 **5 Claims**

1. An electrophotographic method for forming a color separation image and a black separation image comprising:

(a) providing an original containing false-color information corresponding to the black separation image desired, and color information corresponding to the color separation image desired, the false-color information being capable of selectively absorbing actinic light in a first wavelength region, W_1, of the spectrum, and the color information being capable of selectively absorbing actinic light in a second wavelength region, W_2, of the spectrum;

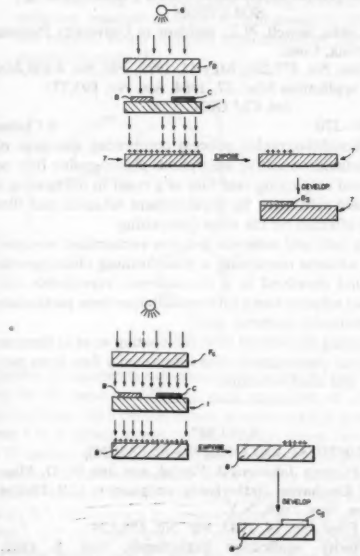
(b) forming a black separation image by:

(i) illuminating the original either with light having wavelengths within the W_1 region only, or with light having wavelengths in both the W_1 and W_2 wavelength regions which is filtered after illuminating the original to exclude all light except that having W_1 wavelengths, thereby forming a first pattern of light corresponding to the false-color information;

(ii) exposing a first photoreceptor charged to a given polarity to the first pattern of light to form a first electrostatic image of said polarity; and

(iii) developing the first electrostatic image with a black or neutral toner; and

(c) forming a nonoverlapping color separation image by:



(i) illuminating the original either with light having wavelengths within the W_2 region only, or with light having wavelengths in both the W_1 and W_2 wavelength regions which is filtered after illuminating the original to exclude all light except that having W_2 wavelengths, thereby forming a second pattern of light corresponding to the color information;

(ii) exposing a second photoreceptor charged to the same polarity as said first photoreceptor to the second pattern of light to form a second electrostatic image of said polarity; and

(iii) developing the second electrostatic image with a colored toner.

4,493,882

IMAGE FORMATION METHOD AND APPARATUS

Shuzo Kaneko, Tokyo; Yasuyuki Tamura, Kawasaki, and Tohru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 444,972
Int. Cl.³ G03G *21/00*
U.S. Cl. 430—97 **14 Claims**

1. An image formation method comprising the steps of:

developing an image bearing member with a first one component conductive developer retained by first retaining means; and

rubbing the surface of the image bearing member bearing a developed image with a second one component conductive developer retained by second retaining means and maintained at a potential to remove the developer which forms a fog in the non-image area of the image bearing member.

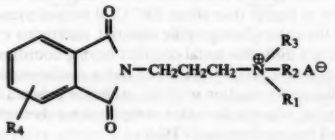
4,493,883

ELECTROPHOTOGRAPHIC TONER COMPOSITIONS CONTAINING NOVEL IMIDE CHARGE CONTROL ADDITIVES

Robert J. Gruber, Rochester, N.Y.; Doretta Agostine, Jenkintown, Pa.; Paul C. Julien, West Webster, and Raymond A. Yourd, III, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 581,926
Int. Cl.³ G03G *9/08*
U.S. Cl. 430—110 **24 Claims**

1. An improved positively charged toner composition comprised of resin particles, pigment particles, and an imide charge enhancing additive of the following formula:



wherein R_1, R_2, and R_3, are alkyl groups of from 1 carbon atom to about 25 carbon atoms, R_4 is selected from the group consisting of hydrogen, nitro, halogen, amino and alkyl and A is an anion.

4,493,884

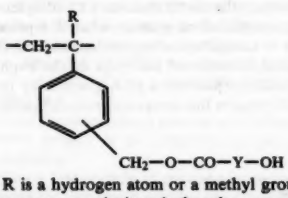
LIGHT-SENSITIVE COMPOSITION

Teruo Nagano, Kanagawa, and Akira Nagashima, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1983, Ser. No. 497,282
Claims priority, application Japan, May 21, 1982, 57-85765
Int. Cl.³ G03C *1/60*; G03F *7/08*
U.S. Cl. 430—192 **12 Claims**

1. A light-sensitive composition, comprising:

90 to 5 wt % of a high molecular compound as a homopolymer or a copolymer having in its molecular structure a structure unit represented by the general formula (I):



(I)

wherein R is a hydrogen atom or a methyl group, and Y is a phenylene group, a substituted phenylene group, a naphthylene group or a substituted naphthylene group in admixture with 10 to 50 wt % based on the light-sensitive composition, of a light-sensitive o-naphthoquinone-diazide compound.

4,493,885
PHOTOGRAPHIC MATERIAL WITH METAL COMPLEXED DYES

Shinsaku Fujita; Yukio Maekawa, and Shigetoshi Ono, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

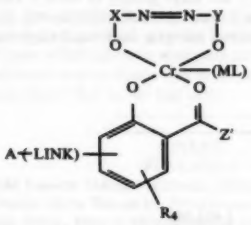
Continuation of Ser. No. 285,245, Jul. 20, 1982, abandoned, which is a continuation of Ser. No. 111,067, Jan. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 962,729, Nov. 21, 1978, abandoned, which is a continuation of Ser. No. 774,173, Mar. 3, 1977, abandoned. This application May 10, 1983, Ser. No. 491,788

Claims priority, application Japan, Mar. 3, 1976, 51-22779; United Kingdom, Mar. 2, 1977, 8879/77

Int. Cl.³ G03C *5/54, 1/40*

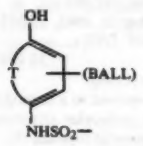
U.S. Cl. 430—223 **10 Claims**

1. A color photographic material for the diffusion transfer process comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a redox compound of high solubility in organic solvents which is dispersed in a hydrophilic colloid using ethyl acetate, cyclohexanone, 2-methoxy methanol or acetone, and a solvent which is substantially insoluble in water and has a boiling point of higher than about 200° C. at normal pressure, the solvent which is substantially insoluble in water and having a boiling point of higher than about 200° C. at normal pressure remaining in the color photographic material, said redox compound releasing a diffusible metal complex having coordinated therewith a dye or a precursor thereof and a cyclic or chain multidenate ligand by reaction with the oxidation product of a developing agent, wherein the redox compound is a dye releasing compound having formula (VIIIa)



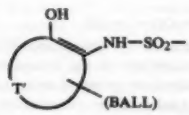
(VIIIa)

wherein A represents a redox compound represented by formula (VIIa) or (VIIb)



(VIIa)

wherein T represents the atoms necessary to complete a benzene nucleus or a naphthalene nucleus; when T represents the atoms necessary to complete the naphthalene nucleus (BALL) may be connected to either of the rings of the naphthalene nucleus; and (BALL) represents a photographically inert ballast group which renders the compound non-diffusible;



(VIIb)

wherein T' has the same meaning as T in formula (VIIa) and (BALL) is as described above;

X represents an arylene group; Y represents an arylene group for a 5-membered or 6-membered nitrogen-containing heterocyclic ring; (ML) represents a monodentate ligand having a nitrogen atom or an oxygen atom as a coordination atom; (LINK) represents a divalent linking group; R_4 represents a lower alkyl group, a lower alkoxy group, a halogen atom or a hydrogen atom; and Z' represents a hydroxy group.

4,493,886
COMPOSITION AND METHOD FOR FORMING AMORPHOUS CHALCOGENIDE FILMS FROM SOLUTION

Imants R. Lauks, Sewell, N.J., assignor to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 377,222, May 11, 1982, Pat. No. 4,439,464. This application Mar. 27, 1984, Ser. No. 593,773

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—270 **8 Claims**

1. In a photolithographic process comprising the steps of forming a radiation-sensitive amorphous chalcogenide film on a substrate and employing said film as a resist in delineating a pattern on said substrate, the improvement wherein said film formation is effected by the steps comprising:

(a) coating onto said substrate in a non-vacuumized environment a solution containing a glass-forming chalcogenide compound dissolved in a non-aqueous vaporizable solvent, said solution being substantially free from particulate or crystallizable material; and

(b) evaporating the solvent from the coating so as to form an amorphous chalcogenide film substantially free from particulate and microstructure.

4,493,887
OPTICAL RECORDING ELEMENT

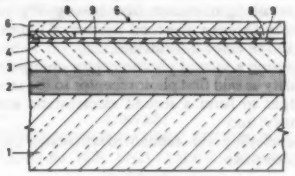
Winfried L. Peeters; Johannes J. Ponjeé, and Jan W. D. Martens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,124

Claims priority, application Netherlands, Nov. 5, 1982, 8204291

Int. Cl.³ G03C *1/495, 1/80*

U.S. Cl. 430—275 **9 Claims**



1. A optical recording element comprising a transparent supporting plate, a recording layer situated on one surface of said supporting plate, an optically readable reflecting optical structure comprising reflection areas situated alternately at a higher level and a lower level situated on the same side of said supporting plate as said recording layer, said optical structure comprising a layer of synthetic resin, containing a spiral-like groove or a groove built up from concentric circles, and a reflection layer provided over the entire surface of said synthetic resin layer, characterized in that the recorded layer is situated between the transparent supporting plate and the optically readable reflecting optical structure and the reflection layer of the reflecting optical structure is situated of said synthetic resin layer remote from the recording layer.

4,493,888

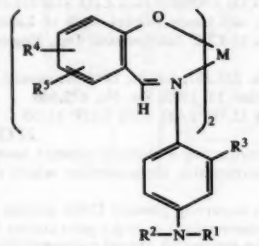
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Katsusuke Endo; Eiichi Kato; Nobutaka Ohki, and Takatoshi Ishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 15, 1983, Ser. No. 514,216
Claims priority, application Japan, Jul. 15, 1982, 57-123309
Int. Cl.³ G03C 5/24, 1/02
U.S. Cl. 430—405 8 Claims

1. A method for forming a photographic image, comprising the steps of:

providing a silver halide photographic light-sensitive material comprising a support base having position thereon a diffusion resistant coupler, a light-sensitive silver halide and organic metal complex represented by the following general formula (I):



wherein M represents a divalent metal atom; R^1 and R^2, which may be the same or different, each represents an alkyl group having from 1 to 5 carbon atoms, a hydroxyalkyl group having from 1 to 5 carbon atoms, an alkoxyalkyl group having from 2 to 10 carbon atoms or an alkylsulfonamidoalkyl group having from 2 to 10 carbon atoms, or R^1 or R^2 may be bonded to each other to form a heterocyclic ring together with the nitrogen atom; R^3, represents a hydrogen atom, an alkyl group having from 1 to 5 carbon atoms or an alkoxy group having from 1 to 5 carbon atoms; and R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxy group, an amino group, a carboxylic acid group, a sulfonic acid group, an alkoxycarbonyl group, an alkyl group or an alkoxy, or R^4 and R^5 may be bonded to each other to form a 5-membered or 6-membered ring;

imagewise exposing the material;

developing the material with an activator solution comprising an alkaline processing solution having a pH of from 7 to 14.

4,493,889

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Yuji Mihara; Satoshi Nagaoka, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1984, Ser. No. 573,181
Claims priority, application Japan, Jan. 24, 1983, 58-9613
Int. Cl.³ G03C 1/02
U.S. Cl. 430—572 17 Claims

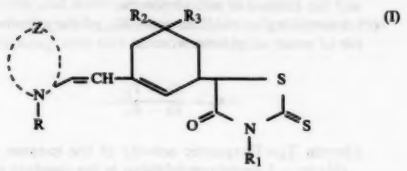
1. A silver halide photographic light-sensitive material, comprising:

a support having thereon

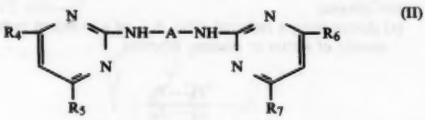
a red-sensitive silver halide photographic emulsion layer comprising

a tetramethine melocyanine dye represented by the general formula (I) and

a compound represented by the general formula (II)



wherein R and R_1 each represents an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or an allyl group, and at least one of R and R_1 represents an alkyl group containing a sulfo group or an alkyl group containing a carboxyl group, R_2 and R_3 each represented an alkyl group, Z represents a nonmetal atomic group necessary to complete a 5-membered or 6-membered heterocyclic nucleus containing nitrogen,



wherein A represents a divalent aromatic residue, R_4, R_5, R_6 and R_7 independently represent a hydrogen atom, a hydroxy group, a lower alkyl group, an alkoxy group, an aryloxy group, a halogen atom, a heterocyclic group, an alkylthio group, a heterocyclylthio group, an arylothio group, an amino group, a substituted or unsubstituted alkylamino group, a substituted or unsubstituted arylamino group, a heterocyclylamino group, a substituted or unsubstituted aralkylamino group, an aryl group or a mercapto group, and at least one of A, R_4, R_5, R_6 and R_7 represents a group substituted with at least one sulfo group.

4,493,890

ACTIVATED APOGLUCOSE OXIDASE AND ITS USE IN SPECIFIC BINDING ASSAYS

David L. Morris, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 246,591, Mar. 23, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,427
Int. Cl.³ G01N 33/54; C12N 9/96
U.S. Cl. 435—7 33 Claims

1. A method for increasing the ability of apoglucose oxidase to combine with flavin adenine dinucleotide and derivatives thereof to form active glucose oxidase comprising the step of interacting apoglucose oxidase with anti-glucose oxidase.

4,493,891

DETERMINATION OF OXIDIZED α-1-PROTEINASE INHIBITOR IN SERUM OR PLASMA

James Travis, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Jul. 27, 1982, Ser. No. 402,442
Int. Cl.³ C12Q 1/38; C12N 9/99
U.S. Cl. 435—23 13 Claims

1. A method for determining percent of oxidized α-1-proteinase inhibitor present in an unknown sample of serum or plasma comprising:

(a) assaying a first portion of the unknown sample of serum or plasma for enzymatic activity of an enzyme inhibitable by α-1-proteinase inhibitor;

(b) assaying a second portion of the unknown sample of serum or plasma for enzymatic activity of an elastase;

(c) selecting known standards and determining activity for

both the enzyme inhibitable by α-1-proteinase inhibitor and the elastase in said standards;

(d) determining an oxidized ratio, K_o, of the unknown sample of serum or plasma wherein

$$K_o = \frac{T_k - T_u}{E_k - E_u}$$

wherein T_k=Enzymatic activity of the enzyme inhibitable by α-1-proteinase inhibitor in the standard solution of said enzyme;

wherein T_u=Enzymatic activity of the enzyme inhibitable by α-1-proteinase inhibitor of an unknown solution comprising the standard solution of said enzyme and the unknown sample of serum or plasma;

wherein E_k=Enzymatic activity of the elastase in the standard solution of the elastase; and

wherein E_u=Enzymatic activity of the elastase of an unknown solution comprising the standard solution of the elastase and the unknown sample of serum or plasma;

(e) determining a reduced ratio, K_R, of a standard reduced sample of serum or plasma, wherein

$$K_R = \frac{T_k - T_r}{E_k - E_r};$$

wherein T_k=Enzymatic activity of the enzyme inhibitable by α-1-proteinase inhibitor in the standard solution of said enzyme;

wherein T_r=Enzymatic activity of the enzyme inhibitable by α-1-proteinase inhibitor in a known solution comprising the standard solution of said enzyme and the standard reduced sample of serum or plasma;

wherein E_k=Enzymatic activity of the elastase in the standard solution of the elastase; and

wherein E_r=Enzymatic activity of the elastase in a known solution comprising the standard solution of the elastase and the standard reduced sample of serum or plasma;

(f) substituting the reduced ratio and the oxidized ratio into an equation

$$X = \left(1 - \frac{K_R}{K_o}\right) 100$$

and solving the equation for X, whereby X is the percent of oxidized α-1-proteinase inhibitor.

4,493,892

SOLVENT SYSTEM FOR PEROXIDASE INHIBITOR REAGENT FOR FECAL OCCULT BLOOD DETERMINATIONS

Martin Fleisher, Glen Cove, N.Y., assignor to Memorial Hospital for Cancer & Allied Diseases, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,526

Int. Cl.³ C12Q *1/28*; G01N *33/72*

U.S. Cl. 435—28 **13 Claims**

1. In a process for determining the presence of fecal occult blood in a test sample which comprises inhibiting peroxidase enzyme interferences by partially denaturing the peroxidase enzyme protein using a protein-hydrogen bond cleaving agent, and simultaneously removing metals necessary for efficient peroxidase enzyme activity, and thereafter using a guaiac-peroxidase test matrix to determine fecal occult blood;

the improvement comprising

dissolving said protein-hydrogen bond cleaving agent in an alcohol-water solvent formed of approximately 20 to 50% by volume of methanol, ethanol, isopropanol or n-butanol in water; and thereafter

adding said agent to the sample.

8. In a process for determining the presence of fecal occult blood in a test sample which comprises inhibiting peroxidase enzyme interferences by partially denaturing the peroxidase enzyme protein using protein-hydrogen bond cleaving agent, and simultaneously removing metals necessary for efficient peroxidase enzyme activity, and thereafter using a guaiac-peroxidase test matrix to determine fecal occult blood by the development of a blue color based on the phenolic oxidation of guaiac by hemoglobin in the presence of hydrogen peroxide,

the improvement comprising

adding a weak acid having an acid strength approximately the same as acetic acid to the reaction before developing the color.

4,493,893

PROCESS FOR CLONING THE GENE CODING FOR A THERMOSTABLE ALPHA-AMYLASE INTO *ESCHERICHIA COLI* AND *BACILLUS SUBTILIS*

Jonathan R. Miclenz, and Susan Mickel, both of LaGrange Park, Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 225,287, Jan. 15, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 472,646

Int. Cl.³ C12N *15/00, 1/00, 9/26*; C12P *21/00*

U.S. Cl. 435—172.3 **22 Claims**

1. A process for constructing a chimeric plasmid having a gene coding for a thermostable alpha-amylase which comprises:

(a) cutting naturally-occurring plasmid DNA present in a strain of *B. stearothermophilus* having a gene coding for a thermostable alpha-amylase to obtain a linear DNA sequence containing the alpha-amylase coding gene;

(b) cutting a suitable vector to obtain a second linear DNA sequence; and

(c) joining the linear DNA sequences of Steps (a) and (b).

4,493,894

POLYSACCHARIDE BEADS

Yutaka Miyashiro, Nara; Masao Ogawa, Osaka; Yoshio Yamazaki, Toyonaka, and Seizi Igarasi, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 958,641, Nov. 8, 1978, abandoned, which is a division of Ser. No. 734,352, Oct. 20, 1976, Pat. No. 4,143,201. This application Sep. 16, 1980, Ser. No. 187,974

Claims priority, application Japan, Oct. 21, 1975, 50-127196; May 24, 1976, 51-60438

Int. Cl.³ A61K *31/71*

U.S. Cl. 435—178 **13 Claims**

1. In a chemical method comprising the employment of a polysaccharide matrix packed in a column the improvement according to which the matrix material is a water-insoluble β-1,3-glucan gel which is shaped in the form of beads with a diameter within the range of about 5 to 1000μ.

4,493,895

MICROBIAL DEGRADATION OF OBNOXIOUS ORGANIC WASTES INTO INNOCUOUS MATERIALS

Joseph F. Colaruotolo, Grand Island, N.Y.; Ronald H. Olsen, Ann Arbor, Mich., and Peter A. Vandenbergh, Sarasota, Fla., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 305,079, Sep. 24, 1981,. This application Jul. 30, 1982, Ser. No. 404,344

Int. Cl.³ C12R *1/38*; C07G *17/00*; C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—262 **19 Claims**

1. A process for microbial degradation of halogenated organic chemical waste which comprises applying to the locus of said halogenated organic chemical waste strains of microorganisms capable of degrading said halogenated organic chemicals to carbon dioxide, water, and a salt said strains being a member of the group consisting of *Pseudomonas cepacia* var.

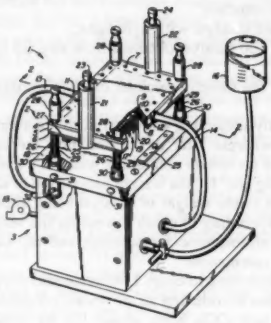
niagarous ATCC 31945, ATCC 31941, ATCC 31942, ATCC 31940, ATCC 31943, ATCC 31944, ATCC 31939, and mutants thereof and monitoring removal of the contaminants from the locus of the application.

4,493,896

DUAL CHAMBER MICROPLATE WASHER

George B. La Motte, III, Larkspur, and Samuel Burd, Oakland, both of Calif., assignors to Bio-Rad Laboratories, Inc., Calif.

Filed Oct. 14, 1982, Ser. No. 434,309
Int. Cl.³ C12M *1/00, 1/32;* B01L *3/00*
U.S. Cl. 435—287 8 Claims



1. An apparatus for the filling and evacuation of all wells simultaneously of a multiwell microplate, said apparatus comprising:

a distribution head comprising three parallel plates designated, respectively, an upper plate, a middle plate, and a lower plate, said plates spaced apart to form gaps therebetween and thereby define two enclosed chambers designated, respectively, an upper chamber and a lower chamber with said middle plate forming a common boundary therebetween, said lower plate having affixed therein a plurality of tubes spaced apart from each other, each said tube passing through said lower plate and perpendicular thereto, said tubes forming a rectangular array such that, when said distribution head is superimposed over said microplate, a pair of said tubes is aligned with each well of said microplate, the portions of each tube of said pair which extends below said lower plate being of unequal length thereby defining a more extended tube and a less extended tube, said less extended tube extending upward through said lower chamber and said middle plate to terminate above the upper surface of said middle plate inside the interior of said upper chamber, and said more extended tube providing an open passage from its lower end to the interior of said lower chamber,

a support for said microplate, said support comprising a substantially flat horizontal surface containing guide means adapted to secure said microplate in a predetermined position on said support surface,

means for aligning said distribution head above said support with said upper, middle, and lower plates of said distribution head and said support surface in parallel relation, and for narrowing and widening the distance between said distribution head and said support surface while substantially maintaining said parallel relation,

stop means for setting a minimum spacing distance between said distribution head and said support surface such that when said distance is at said minimum, the exposed end of the more extended tube of each said tube pair is sufficiently close to the bottom of the corresponding well in said microplate to permit evacuation of substantially all liquid from said well,

means for applying a vacuum to said chamber communicating with said more extended tube, and

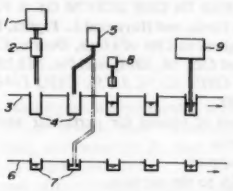
means for supplying pressurized fluid to the chamber communicating with said less extended tube.

4,493,897

METHOD FOR MEASURING AN ELECTROLYTE IN AN AUTOMATIC BIOCHEMICAL ANALYZING APPARATUS WHEREIN A FLAME PHOTOMETER IS ASSEMBLED

Takashi Tabara, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,217
Claims priority, application Japan, Jul. 9, 1980, 55-93570; Jul. 9, 1980, 55-93571
Int. Cl.³ G01N *35/02;* G01J *3/30;* G01N *21/72*
U.S. Cl. 436—47 3 Claims



1. A method for measuring an electrolyte concentration in an automatic biochemical analyzing apparatus comprising the steps of:

(a) providing a series of sample cups, said sample cups each containing a sample;

(b) ordering a sample pipetting and delivering means to remove a sample from a first sample cup and transfer said sample to a first reaction cup;

(c) ordering said sample pipetting and delivering means not to remove a sample from a second sample cup and not to transfer said sample from said second sample cup to a second reaction cup;

(d) ordering a reagent liquid delivering means successively to deliver reagent liquid to each reaction cup in said series of reaction cups;

(e) successively supplying the contents of each reaction cup to a flame photometer;

(f) successively analyzing the contents of each reaction cup in said flame photometer;

wherein said reagent liquid delivering means is ordered to deliver a first reagent liquid to said first reaction cup and a second reagent liquid to a second reaction cup, said second reagent liquid comprises a standard sample reagent liquid being prepared by diluting a standard electrolyte solution having a known concentration with said first reagent liquid, said standard sample reagent liquid having a dilution ratio identical to a dilution ratio created when said sample removed from said first sample cup is tranferred to said first reaction cup and diluted with said first reagent liquid, said standard sample reagent liquid being measured by said flame photometer to determine the concentration thereof, a calibrating factor being determined by dividing the concentration of said standard electrolyte solution by the concentration of said standard sample reagent liquid whereby said flame photometer is calibrated by multiplying a measured value of the contents of said first reaction cup by said calibration factor;

whereby said flame photometer is maintained in a substantially stable operating condition.

4,493,898

METHOD FOR DETECTING AND MONITORING CANCER

Stephen L. Sallay, Fort Wayne, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 25, 1983, Ser. No. 488,133
Int. Cl.³ G01N 31/02, 33/48, 33/68
U.S. Cl. 436—64 10 Claims

1. A method for diagnosing and monitoring cancer in humans which comprises mixing benzenesulfonic acid, benzylsulfonic acid, a lower-alkylbenzenesulfonic acid or a lower-alkylbenzylsulfonic acid with human serum in an amount effective to precipitate components insoluble in the resulting acidic liquid phase without substantially affecting sialic acid level in the liquid phase, determining the sialic acid content of the acidic supernatant, and comparing said sialic acid content with the sialic acid content of healthy human sera after identical treatment.

4,493,899

METHOD OF TESTING FOR PARTICULAR ANTIBODIES IN THE SERUM OF A PATIENT

Lloyd H. Smith, Davis, and Raymond L. Teplitz, Pasadena, both of Calif., assignors to City of Hope, Duarte, Calif.

Filed Oct. 16, 1981, Ser. No. 312,159
Int. Cl.³ G01N 33/54, 33/56; C12Q 1/44, 1/68
U.S. Cl. 436—508 33 Claims

1. In a method of testing for particular antibodies in the serum of a patient,

providing a support,

attaching DNA to the support,

applying the serum to the supported DNA to obtain an attachment of the particular antibodies in the serum to the DNA with substantially no attachment of the particular antibodies in the serum to the support, and

providing an assay to determine if the particular antibodies have been attached to the DNA.

4,493,900

LOW MELTING ENAMEL FRITS

Atsushi Nishino, Neyagawa; Masaki Ikeda; Kunio Kimura, both of Hirakata, and Hajime Oyabu, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Feb. 4, 1983, Ser. No. 463,937
Claims priority, application Japan, Feb. 8, 1982, 57-19243
Int. Cl.³ C03C 7/02, 7/06
U.S. Cl. 501—26 9 Claims

1. A low melting enamel frit comprising 31 to 39 weight percent of SiO_2, 13 to 21 weight percent of B_2O_3, 14 to 22 weight percent of Na_2O, 1 to 5 weight percent of K_2O, 13 to 20 weight percent of ZnO, 2 to 10 weight percent of F_2, and 2 to 9 weight percent of at least one intermediate oxide selected from the group consisting of Al_2O_3, TiO_2 and ZrO_2, each intermediate oxide not exceeding 5 weight percent, provided that the SiO_2/B_2O_3 ratio by weight is in the range of 1.5 to 3.0:1;

the total amount of ZnO, Al_2O_3, TiO_2 and ZrO_2 is in the range of 17 to 25 weight percent;

the $ZnO/(ZnO+Al_2O_3+TiO_2+ZrO_2)$ ratio by weight is in the range of 0.65 to 0.90:1;

the total amount of Na_2O+K_2O is in the range of 16 to 23 weight percent;

the $(ZnO+Al_2O_3+TiO_2+ZrO_2)/(Na_2O+K_2O)$ ratio by weight is in the range of 0.85 to 1.2:1;

the $(SiO_2+B_2O_3+F_2)/(Na_2O+K_2O+ZnO)$ ratio by weight is in the range of 1.3 to 2.0:1;

said composition being substantially free from lead and phosphorous, said frit capable of being fired at temperatures lower than the A_1 transformation point of iron.

4,493,901

REGENERATION PROCESS OF AN AROMATIZATION CATALYST CONTAINING A GROUP VIII METAL ON A ZEOLITE

Jean R. Bernard, Solaize, and Michèle Breysse, Caluire, both of France, assignors to Elf France, Paris, France

Filed Sep. 3, 1982, Ser. No. 414,675
Claims priority, application France, Sep. 9, 1981, 81 17064
Int. Cl.³ B01J 23/96, 29/38; C07C 5/393; C10G 35/085
U.S. Cl. 502—37 6 Claims

1. A process for the regeneration of an aromatization catalyst formed of zeolite-L having exchangeable cations of which at least 90% are alkali metal ions and containing platinum which process comprises:

(a) treating said catalyst with hydrogen;

(b) subjecting said catalyst obtained from step (a) to calcination;

(c) subjecting the thereby calcined catalyst to oxychlorination; and

(d) subsequently subjecting said catalyst to reactivation with hydrogen, wherein after oxychlorination the catalyst is cooled by an air stream containing water at a temperature not exceeding 200° C., the weight proportion of said water with respect to the weight of catalyst being about 10%.

5. A process according to claim 1 wherein the temperature of the water is atmospheric temperature and the catalyst is ground prior to calcination.

6. A process according to claim 1, wherein said oxychlorination step comprises introducing an air stream containing CCl_4, the quantity of said CCl_4 being about 1% by weight with respect to the weight of said catalyst.

4,493,902

FLUID CATALYTIC CRACKING CATALYST COMPRISING MICROSPHERES CONTAINING MORE THAN ABOUT 40 PERCENT BY WEIGHT Y-FAUJASITE AND METHODS FOR MAKING

Stanley M. Brown, Scotch Plains; Vincent A. Durante, East Brunswick; William J. Reagan, Englishtown, and Barry K. Speronello, River Edge, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Feb. 25, 1983, Ser. No. 469,765
Int. Cl.³ B01J 21/16, 29/08
U.S. Cl. 502—65 62 Claims

1. A fluid catalytic cracking catalyst comprising microspheres containing at least about 40% by weight Y-faujasite and having less than about 0.20 cc/g. of pores having diameters in the range of 20–100Å, said microspheres having the following characteristics:

(a) a deactivated activity at least about 1.5 times that of standard commercial catalyst;

(b) a severely deactivated activity at least about 1.5 times that of standard commercial catalyst;

(c) a coke yield no greater than about that of standard commercial catalyst at 70% conversion; and

(d) an EAI no more than about 5.0 times that of standard commercial catalyst.

24. A fluid catalytic cracking catalyst comprising microspheres containing more than about 40% by weight Y-faujasite, less than about 0.7 by weight Na_2O, more than about 4% by weight REO, and having a SiO_2/Al_2O_3 molar ratio of about 1.7–3.4, less than about 0.20 cc/g. of pores having diameters in the range of 20–100Å, less than about 0.30 cc/g. of pores having diameters in the range of 600–20,000Å, a surface area of about 300–750m^2/g. and a bulk density of the 200/270 mesh fraction of about 0.8–1.2 g/cc., said microspheres comprising:

(a) a non-zeolitic component comprising the zeolite crystallization process residue of calcined clay, said calcined clay comprising about 30–60% by weight metakaolin and about 40–70% by weight kaolin clay that had been calcined at least substantially through its characteristic exotherm; and

(b) Y-faujasite having, in the sodium form, a crystalline unit cell size of less than about 24.73Å.

37. The method for making a fluid catalytic cracking catalyst comprising the steps of:

(a) forming an aqueous slurry of finely divided hydrous kaolin clay and finely divided kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(b) spray drying the aqueous slurry to obtain microspheres comprising a mixture of hydrous kaolin clay and kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(c) calcining the microspheres obtained in step (b) at a temperature and for a time sufficient to convert the hydrous kaolin clay in the microspheres substantially to metakaolin and to obtain microspheres of calcined clay comprising a mixture of about 30–60% by weight metakaolin and about 40–70% by weight kaolin clay that has been calcined at least substantially through its characteristic exotherm;

(d) mixing the microspheres obtained in step (c) with one or more sources of sodium silicate and water to obtain an alkaline slurry of microspheres of calcined clay in an aqueous solution containing sodium silicate, said sodium silicate being provided in an amount so that microspheres having a SiO_2/Al_2O_3 molar ratio of about 1.7–3.4 are obtained in step (h) below;

(e) adding zeolite initiator to the kaolin clay that has been calcined at least substantially through its characteristic exotherm before step (f) below;

(f) heating the slurry of microspheres of calcined clay to a temperature and for a time sufficient to crystallize at least about 40% by weight Y-faujasite in the microspheres, said Y-faujasite being in the sodium form;

(g) separating the microspheres containing at least about 40% by weight Y-faujasite from at least a major portion of its mother liquor;

(h) replacing sodium cations in the microspheres separated in step (g) with ammonium or rare earth cations or both.

4,493,903

POLYMERIZATION PROCESS FOR DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 262,870, May 12, 1981, Pat. No. 4,433,123, which is a continuation-in-part of Ser. No. 7,088, Jan. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 953,144, Oct. 20, 1978, abandoned. This application Nov. 7, 1983, Ser. No. 549,359

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—121 **3 Claims**

1. A catalyst for the polymerization of γ-olefins containing from 2 to 30 carbon atoms, to form non-crystalline, hydrocarbon-soluble polymers; comprising,

(a) titanium trichloride of the general formula $TiCl_3.mAlCl_3$ wherein m is from 0.00 to 1.00, which is selected from the group consisting of products produced by;

(1) reducing titanium tetrachloride with aluminum,

(2) reducing titanium tetrachloride with hydrogen,

(3) reducing titanium tetrachloride with an organometallic compound, or

(4) milling titanium tetrachloride with a Group II metal, in conjunction with

(b) a ketone,

(c) a compound selected from the group consisting of Group IA or IIA metal halides, transition metals, quaternary ammonium halide or sulfate salts, alkaline earth phosphates and alkyl alkali metal sulfates,

(d) an organo-aluminum halide of the formula AlR_nX_{3-n} where R is a hydrocarbon radical, X is halogen and n is 2 or 3, and

(e) a catalyst modifier of the formula $PR_1R_2R_3$ or $P(OR_1)(OR_2)(OR_3)$ wherein R_1, R_2, and R_3 are, independently, aryl, alkyl, aralkyl, or alkaryl.

4,493,904

CATALYST AND METHOD FOR PREPARATION OF DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

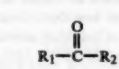
Division of Ser. No. 278,264, Jun. 29, 1981, Pat. No. 4,415,714, Continuation-in-part of Ser. No. 7,125, Jan. 29, 1979, abandoned, Continuation-in-part of Ser. No. 606, Jan. 2, 1979, abandoned. This application Aug. 22, 1983, Ser. No. 525,525

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—122 **13 Claims**

1. An improved Ziegler/Natta catalyst for the polymerization of α-olefins containing from 2 to 30 carbon atoms, to form non-crystalline, hydrocarbon-soluble polymers said catalyst containing a titanium halide, wherein titanium has a valence less than maximum, and an organoaluminum compound, the improvement comprising modifying the catalyst by adding

(1) cyclic or acyclic ketone(s) of the general formula



wherein R_1 and R_2 are, independently, aryl, alkyl, cycloalkyl, alkaryl, and aralkyl, each containing from 1 to 20 carbon atoms, and wherein R_1 and R_2 can be joined through a covalent bond, and

(2) a monoether of the formula R_3OR_4 wherein R_3 and R_4 are, independently, aryl, alkyl, aralkyl, cycloalkyl, alkaryl, each containing from 1 to 20 carbon atoms.

4. A catalyst as described in claim 1 comprising:

(a) titanium trichloride of the general formula $TiCl_3.nAlCl_3$ wherein n is from 0.00 to 0.50, which is selected from the group consisting of products produced by;

(1) reducing titanium tetrachloride with aluminum,

(2) reducing titanium tetrachloride with hydrogen,

(3) reducing titanium tetrachloride with an organo-metallic compound, or

(4) milling titanium tetrachloride with a Group III metal salt, in conjunction with

(b) a saturated acyclic ketone, and/or a saturated cyclic ketone,

(c) a compound selected from the group consisting of Group IA or IIA metal halides, transition metals, quanternary ammonium halide or sulfate salts, alkaline earth phosphates and alkyl alkali metal sulfates,

(d) a catalyst modifier of the formula R_3OR_4 wherein R_3 and R_4 are, independently, aryl, alkyl, aralkyl, or alkaryl containing up to 20 carbon atoms each.

4,493,905

FLUID BED CATALYST FOR SYNTHESIS GAS CONVERSION AND UTILIZATION THEREOF FOR PREPARATION OF DIESEL FUEL

Harold Beuther, Cheswick; Charles L. Kibby, Gibsonia; T. P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 310,977, Oct. 13, 1981, Pat. No. 4,413,064. This application Oct. 11, 1983, Ser. No. 540,662

Int. Cl.³ B01J *23/40, 27/24, 23/10, 23/62*

U.S. Cl. 502—325 **18 Claims**

1. A process for the preparation of a catalyst useful in the fluidized bed conversion of synthesis gas, which consisting essentially of contacting finely divided alumina with (A) an aqueous impregnation solution of a cobalt salt, and thereafter (B) a nonaqueous, organic impregnation solution of a ruthenium salt and a salt of a Group IIIB or IVB metal.

4,493,906

CATALYST FOR THE SELECTIVE HYDROGENATION OF ACETYLENES

Mark C. Couvillion, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 473,293, Mar. 8, 1983, Pat. No. 4,440,956, which is a continuation-in-part of Ser. No. 436,250, Oct. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 299,688, Sep. 8, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,128

Int. Cl.³ B01J *21/04, 23/72*

U.S. Cl. 502—346 3 Claims

1. A catalyst for removing α-acetylenes from liquid hydrocarbon streams consisting essentially of finely divided copper metal dispersed on an aluminum oxide support, said support being a gamma alumina as defined by the Joint Committee on Powder Diffraction Standards, #29-63, of high purity having a surface area of between about 68 and about 350 square meters per gram, and 98 to 40 percent of the pores have a pore diameter between about 40Å and 120Å and not more than 25 percent nor less than 2 percent have, a pore diameter between 1000Å to 10,000Å, a silicon content as SiO_2 of less than about 0.15 weight %, a sodium content as Na_2O of less than about 0.15 weight %, a sulfur content less than about 0.01 weight % and an iron content as Fe_2O_3 of less than about 0.06 weight %, said gamma alumina may contain up to 35% by weight of alpha alumina.

4,493,907

METHOD OF USING HIGHER CONCENTRATION SULFURIC ACID FOR STRIPPING AND PRECIPITATION OF ADSORBED MAGNESIUM

Harold N. Hedrick, Brandon, and Solon G. Whitney, Bartow, both of Fla., assignors to American Petro Mart, Inc., Bartow, Fla.

Continuation-in-part of Ser. No. 386,768, Jun. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 275,651, Jun. 22, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 478,167

Int. Cl.³ B01D *15/06;* B01J *49/00*

U.S. Cl. 521—26 12 Claims

1. In a folded bed ion exchange system for removing magnesium ions from aqueous phosphoric acid prepared by the wet process from phosphate rock, the method of regenerating a cation exchange resin loaded with adsorbed magnesium ions and precipitating the stripped magnesium ions, comprising:

(a) sequentially introducing increments of said loaded resin into the bottom portion of a regeneration column while sequentially removing regenerated increments of said resin from the top portion of said column, said increments sequentially moving upwardly in said column from the bottom to the top thereof;

(b) introducing an aqueous sulfuric acid (H_2SO_4) regenerating solution into the top portion of said column at a concentration of 40% or higher H_2SO_4 by weight and passing said regenerating solution downwardly within said column, the H_2SO_4 concentration of said regenerating solution progressively decreasing as said solution flows downwardly through the upwardly moving resin increments, whereby the most recently introduced increment in the column bottom portion is in contact with an H_2SO_4 solution of relatively low concentration while the increment in the top portion prior to its removal is in contact with an H_2SO_4 solution of relatively high concentration;

(c) removing a magnesium ion-containing sulfuric acid solution of reduced H_2SO_4 concentration from the lower portion of said column, said removal acid concentration being at least 10 to 20% lower than the introduction concentration and below a concentration at which the magnesium ions precipitate; and

(d) precipitating magnesium sulfate from said removed solution by increasing the H_2SO_4 concentration of said solution to a sufficiently high H_2SO_4 concentration to cause the magnesium sulfate to form a solid crystalline compound.

4,493,908

STABLE DISPERSIONS OF POLYMERS IN POLYFUNCTIONAL COMPOUNDS HAVING A PLURALITY OF ACTIVE HYDROGENS

Thomas E. Fisk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 467,409, Feb. 17, 1983,. This application Feb. 17, 1984, Ser. No. 581,405

Int. Cl.³ C08G *18/10;* C08L *75/00*

U.S. Cl. 521—137 15 Claims

1. A stable improved copolymer dispersion which comprises:

(A) a polyahl having dispersed therein;

(B) an addition copolymerizate of (1) a monomeric adduct of (a) an active ethylenicallyunsaturated haloglyoxylyl monomer and (b) a monoahl or a polyahl with (2) at least one other ethylenically unsaturated monomer; or

(C) (1) an addition copolymer of a haloglyoxylyl monomer with at least one other ethylenically unsaturated monomer and (2) a monoahl or polyahl; or

(D) a mixture of (B) and (C); or

(E) a mixture of (B) and/or (C) and a polymer of at least one other ethylenically unsaturated monomer.

4,493,909

POLY-N,N-HYDROXYALKYLAMIDES OF POLYBASIC CARBOXYLIC ACIDS AND A PROCESS FOR THE PRODUCTION THEREOF

Peter Haas, Haan, and Hans Hettel, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

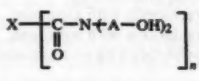
Filed Jun. 7, 1982, Ser. No. 386,129

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124885; Dec. 18, 1981, 3150269

Int. Cl.³ C08G *18/14, 18/18, 18/20*

U.S. Cl. 521—166 16 Claims

1. A process for the production of an open-cell polyurethane foam in which a compound having at least two isocyanate-reactive hydrogen atoms and a molecular weight of from 400 to 10,000 and a polyisocyanate are reacted in the presence of a catalyst, a blowing agent and 0.1 to 10 wt. % cell-opening component (based on mixture with compound having at least two isocyanate-reactive hydrogen atoms) said cell-opening component corresponding to the formula



in which

n represents an integer from 2 to 6;

X represents a single bond (where n=2), an n-functional C_1–C_{10}-straight chain or branched alkane radical optionally substituted by a hydroxyl group, a C_4–C_6-cycloalkane radical optionally containing O, S or N—CH_3 in the ring, or an n-functional C_6–C_{20} aryl radical optionally substituted by one or more hydroxyl groups; and

A represents a straight chain or branched C_2–C_6-akylene group optionally containing an OH group.

4,493,910

FLUORINE-CONTAINING HYDROGEL-FORMING POLYMERIC MATERIALS

Brian J. Tighe, Birmingham, and Howard J. Gee, Derbyshire, both of England, assignors to Kelvin Lenses Limited, Manchester, England

Division of Ser. No. 309,581, Oct. 9, 1981, Pat. No. 4,433,111. This application Jun. 24, 1983, Ser. No. 507,729

Claims priority, application United Kingdom, Oct. 14, 1980, 8033137; Oct. 14, 1980, 8033061

Int. Cl.³ C08F 214/18; G02C 7/04

U.S. Cl. 523—108 13 Claims

1. A contact lens consisting essentially of a copolymer and at least 63% by weight water wherein the copolymer is a crosslinked fluorine-containing polymeric material suitable for use in biomedical applications, containing units derived either by simultaneous copolymerisation and crosslinking or by copolymerisation and subsequent crosslinking of the following monomers:

(1) to 40 mole % of an amide of acrylic or methacrylic acid;

(2) 25 to 55 mole % of an N-vinyl lactam of the N-vinyl pyrrolidone type;

(3) 5 to 20 mole % of a hydroxyalkyl ester of acrylic or methacrylic acid;

(4) 1 to 10 mole % of acrylic or methacrylic acid; and (5) at least about 5 up to about 10 mole % of a hydrophobic monomer component comprising two monomer types a) and b) as follows:

(a) a fluorine-containing olefine, or fluorine-containing unsaturated alcohol, carboxylic acid or ester or a non-fluorine-containing unsaturated alcohol which, after copolymerisation of monomer (1) to (5), is esterified using a fluorine-containing aliphatic carboxylic acid or derivative thereof; and

(b) a non-fluorine-containing polymerisable hydrophobic vinyl monomer which is at least one monomer selected from vinyl aromatic hydrocarbons of the styrene type and hydrophobic esters of acrylic or methacrylic acid;

the monomers (1) to (5) totalling 100 mole %, the crosslinking having been effected with crosslinking amounts of a crosslinking agent, which, in the case of simultaneous copolymerisation and crosslinking, is an ester of a diol and acrylic or methacrylic acid or is divinylbenzene, or, in the case of crosslinking subsequent to copolymerisation, is a latent crosslinking agent which is a diamide of an unsaturated aliphatic carboxylic acid, an anhydride of an aliphatic or aromatic carboxylic acid, a diepoxide or dicumyl peroxide, the crosslinking agent having been used in an amount of up to 5 weight % based on the total weight of monomers (1) to (5).

4,493,911

NONADHESIVE IMPRESSION MATERIAL

Werner Schmitt; Robert Purrmann, both of Starnberg, and Peter Jochum, Hechendorf, all of Fed. Rep. of Germany, assignors to Espe Fabrik pharmazeutischer Praparate, GmbH, Seefeld, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,703

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246654

Int. Cl.³ C08K 5/20; C08L 79/00; A61K 6/10

U.S. Cl. 523—109 10 Claims

1. A nonadhesive impression material comprising a polyether compound with terminal aziridino groups which crosslink when combined with a polymerization initiator and an adhesion reducing amount of oleic acid ethanolamide.

8. A method of making a dental impression comprising the use of a nonadhesive impression material comprising a polyether compound with terminal aziridino groups which crosslink when combined with a polymerization initiator and an adhesion reducing amount of oleic acid ethanolamide.

4,493,912

ELECTROMAGNETIC WAVE ATTENUATING COMPOSITION

Charles D. Dudgeon, Clifton Park, N.Y., and Maynard R. Winstead, Peabody, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,306

Int. Cl.³ C09D 5/32, 3/72, 3/80

U.S. Cl. 523—137 12 Claims

1. A method of making a water-based electromagnetic wave attenuating composition comprising the steps of:

(a) providing an aqueous dispersion of a carboxylated acrylic or an aliphatic urethane resin;

(b) adding an aqueous dispersion of an anionic surfactant or a trifunctional aziridine compound slowly to the aqueous dispersion of item (a) above; and

(c) adding nickel powder to the mixed mixture of item (b) above and blending such powder into the mixed mixture under low shear conditions,

wherein the nickel powder has a chain-like structure and has an average particle size of from about 2.2 to about 2.8 microns, an apparent density of from about 0.5 to about 0.65 g/cc and a specific surface area of about 0.68 m2/g.

4,493,913

FLAME RESISTANT RESIN COMPOSITION

Kazushi Hirobe; Satoshi Tonoki, and Masahiko Nishigaki, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1982, Ser. No. 450,277

Claims priority, application Japan, Dec. 19, 1981, 56-205812; May 15, 1982, 57-82153; Nov. 1, 1982, 57-192200

Int. Cl.³ C08K 3/32, 3/02, 9/10, 9/04

U.S. Cl. 523—205 3 Claims

1. A flame resistant resin composition comprising:

(a) a modified polyethylene terephthalate having a heating crystallization temperature of not more than 120° C.,

(b) 1 to 70 parts of red phosphorus coated with a thermosetting resin, and

(c) 0.1 to 200 parts of a filler, said modified polyethylene terephthalate being a polycondensation product of a dicarboxylic acid component containing at least 90% by mole of terephthalic acid and a diol component containing at least 90% by mole of ethylene glycol and being modified with a modifier selected from the group consisting of a polyoxyalkylene compound, a low molecular organic ester and an ionic copolymer, and said parts of (b) and (c) being parts by weight per 100 parts by weight of (a).

4,493,914

STABILIZED DISPERSION OF CROSS-LINKED POLYMER PARTICLES

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1983, Ser. No. 468,902

Int. Cl.³ C08J 3/26; C08K 5/01, 5/06; C08L 63/10

U.S. Cl. 523—436 13 Claims

1. A stable dispersion containing crosslinked polymer particles characterized in that they are formed by reactions comprising addition polymerization of:

(a) between about 0.5 and about 20 weight percent each of a first and second monomer selected from (i) first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other or (ii) first and second monomers, wherein said first monomer bears ethylenic unsaturation and functionality capable of crosslinking reaction with other functionality present on said second monomer, said second monomer bearing at least two functional groups of said other functionality and bearing no ethylenic unsaturation; and

(b) between about 99 and about 60 weight percent of at

least one other monoethylenically unsaturated monomer.

in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer is first formed and then is crosslinked, said dispersion stabilizer comprising, on the average, more than one long hydrocarbon chain and at least one vinyl unsaturation and being the reaction product of:

(A) an adduct bearing pendant hydroxyl groups and being the reaction product of:

(a) long chain hydrocarbon molecules bearing a carboxyl group and no other reactive group; and

(b) polyepoxide resin having (i) at least two epoxide groups and (ii) a number average molecular weight of between about 140 and 3000, reacted in amounts so as to provide greater than about 1.0 mole of said long chain hydrocarbon molecules bearing a carboxyl group for each mole of said polyepoxide resin; and

(B) ethylenically unsaturated monoisocyanates, wherein said adduct and said ethylenically unsaturated monoisocyanates are reacted in amounts so as to provide at least about 1.0 mole of said monoisocyanate for each mole of said polyepoxide resin employed in said stabilizer formation.

13. Crosslinked polymer particles obtained by removal of said solvent from said dispersion formed in claim 1.

4,493,915

LIGHT STABLE THERMOPLASTIC POLYPHENYLENE ETHER RESIN COMPOSITIONS COMPRISING PURPLE ANTHRAPYRIDONE DYE OR YELLOW QUINOPHTALONE DYE

Johannes H. G. M. Lohmeijer, Hoogerheide, Netherlands, assignor to General Electric Company, Selkirk, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,136

Claims priority, application Netherlands, Oct. 29, 1982, 8204181

Int. Cl.³ C08K *5/34*; C08L *71/04*

U.S. Cl. 524—87 **6 Claims**

1. A thermoplastic polyphenylene ether resin composition having improved resistance to discoloration upon exposure to light, comprising:

a polyphenylene ether base polymer; and

at least one dye capable of bleaching upon exposure to light in an amount effective for compensating for a change in color of said polyphenylene ether base polymer upon exposure to said light wherein said compensating dye is selected from the group consisting of purple anthrapyridone dye or yellow quinophtalone dye.

4,493,916

METHOD FOR EXTENSION OF POT LIFE IN CURING REACTIONS

Roland Sandèn, Tumba, Sweden, assignor to Forsvarets Forskningsanstalt, Stockholm, Sweden

PCT No. PCT/SE82/00437, § 371 Date Aug. 18, 1983, § 102(e) Date Aug. 18, 1983, PCT Pub. No. WO83/02282, PCT Pub. Date Jul. 7, 1983

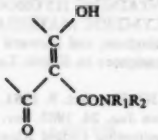
PCT Filed Dec. 22, 1982, Ser. No. 527,517

Claims priority, application Sweden, Dec. 22, 1981, 8107725

Int. Cl.³ C08L *75/04*

U.S. Cl. 524—217 **6 Claims**

1. Method to extend the so-called pot life in production processes where a prepolymer is cured and where the curing reaction is catalyzed in an undesirable way by transition metals being present, characterized in that there is added before the curing reaction a compound, whose structural formula comprises the metal-binding part



wherein each of R_1 and R_2 is hydrogen or a hydrocarbon group.

4,493,917

BLEND OF POLYMERS, ITS PREPARATION AND ITS APPLICATION TO THE MANUFACTURE OF COMPONENTS OF ELECTROCHEMICAL REACTORS

Christian Bailleux, Paris; Michel Bernard, Pont-Ste-Maxence; Bernard Dupont, Creil; Guy Lozach, Chantilly, and Jean-Pierre Mata, Paris, all of France, assignors to Electricite de France, Paris, France

Filed Nov. 3, 1983, Ser. No. 548,532

Claims priority, application France, Nov. 3, 1982, 82 18408

Int. Cl.³ C08L *27/12, 27/18, 81/04, 81/06*

U.S. Cl. 524—394 **14 Claims**

1. A blend of polymers, which is produced by extrusion and/or injection at a temperature between approximately 250° C. and approximately 320° C., of a particulate mixture of a heat-stable material consisting of a polysulfone resin or polyphenylene sulfide and a chemically inert and hydrophobic fluorocarbon polymer resin as a filler, the concentration of said fluorocarbon in said mixture being in a range to produce a network of interconnected and interpenetrated fibers of said fluorocarbon within a matrix of said heat-stable material upon said extrusion and/or injection.

4,493,918

SILICATE FILLED POLYOLEFIN RESIN COMPOSITES

Fred J. Meyer, Chelsea, and Seymour Newman, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 239,858, Feb. 3, 1981, , which is a continuation of Ser. No. 970,839, Dec. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,288, Nov. 7, 1977, abandoned, which is a continuation in part of Ser. No. 783,505, Mar. 31, 1971, abandoned. This application Sep. 7, 1982, Ser. No. 414,998

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.³ C08K *5/02*

U.S. Cl. 524—451 **38 Claims**

1. A composite made by a process which comprises:

A. providing a blend consisting essentially of melt forming resin made from monomers comprising olefinic hydrocarbon monomers, a silane free or substantially silane free silicate and a strengthening amount of an additive that is a minor amount by weight of the resin and silicate, the additive consisting essentially of one or more chlorinated hydrocarbons having a molecular weight of about 250–10,000 and about 60–80% by weight chlorine;

B. maintaining said blend as a melt at a temperature in a range between 170°–300° C. for a time sufficient to strengthen the composite; and

C. subsequently passing said blend to a cooling zone, directly or indirectly, and cooling said blend, being free of silane or substantially free of silane, to below said melt temperature.

4,493,919

POLYMER BLEND COMPOSITION COMPRISING TWO BLOCK POLYMERS A VINYL AROMATIC COPOLYMER AND A POLYESTER

Daniel P. Durbin, Sugarland; Robert G. Lutz, Spring, and Richard L. Danforth, Missouri City, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 8, 1983, Ser. No. 502,407
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.³ C08L 53/02
U.S. Cl. 524—505 9 Claims

1. A thermoplastic molding composition comprising:

(a) from about 10 to about 85 percent by weight of a selectively hydrogenated block copolymer comprising at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, the weight percent of blocks A comprising between 8 and 65 percent by weight of said block copolymers wherein at least 80% of the aliphatic double bonds in block B are hydrogenated and no more than about 25% of the alkenyl aromatic double bonds in block A are hydrogenated;

(b) from about 10 to about 80 percent by weight of a vinyl aromatic copolymer comprising a vinyl aromatic compound and an α, β-unsaturated cyclic anhydride; and

(c) from about 10 to about 80 percent by weight of a thermoplastic polyester having a molecular weight in excess of about 20,000, a melting point over about 120° C., and which polyester is selected from the he group consisting of a condensation product of a dicarboxylic acid and a glycol, polypivalolactone and polycaprolactone;

(d) from about 1 to about 50 percent by weight of a hydrogenated diblock copolymer comprising a monoalkenyl arene polymer and a hydrogenated conjugated diene polymer.

4,493,920

POLYMER COMPOSITIONS

Bi Le-Khac, Westchester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1983, Ser. No. 566,064
Int. Cl.³ C08L 51/08, 69/00
U.S. Cl. 525—67 22 Claims

1. A polymer composition comprising in weight percent, from about 1 to about 99 of a thermoplastic polycarbonate based on bis-(hydroxyaryl) alkanes and from about 99 to about 1 of a random terpolymer of recurring units of a monovinyl aromatic monomer, recurring units of a maleimide monomer and recurring units of an α, β ethylenically unsaturated cyclic anhydride monomer.

4,493,921

IMPACT RESISTANT BLEND

John M. Wefer, Newtown, Conn., assignor to Uniroyal, Inc., Middlebury, Conn.

Continuation of Ser. No. 423,397, Sep. 24, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 584,298
Int. Cl.³ C08L 67/02, 69/00
U.S. Cl. 525—67 9 Claims

1. A blend of

(a) poly(1,4-butylene terephthalate) resin,

(b) polycarbonate resin, and

(c) graft copolymer of at least one monomer on an ethylene-propylene-non-conjugated diene rubber spine, the proportions of (a), (b) and (c) expressed in parts by weight per 100 parts of (a), (b) and (c) being as follows:

(a) 20–90

(b) 5–60

(c) 5–50,

the said monomer being selected from styrene/acrylonitrile, styrene/methyl methacrylate or methyl methacrylate, in an amount of about 5–75% by weight of the graft copolymer (c), the said graft (c) being an inverted composition in which the rubber is a discontinuous phase.

4,493,922

IMPACT-RESISTANT THERMOPLASTIC MOLDING MATERIAL

Adolf Echte, Ludwigshafen, and Hermann Gausepohl, Mutterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 296,894, Aug. 27, 1981, abandoned. This application Jan. 25, 1984, Ser. No. 573,853
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035570
Int. Cl.³ C08L 55/02, 53/02, 51/04
U.S. Cl. 525—71 1 Claim

1. An impact-resistant thermoplastic molding material which essentially contains

A. polystyrene as the matrix and

B. uniformly dispersed therein, two elastomeric polymers or copolymers (b_1) and (b_2), predominantly composed of 1,3-dienes, in an amount of from 3 to 30% by weight, calculated as polybutadiene and based on the matrix, the polymers or copolymers being present as particles of different mean size (different d_{50} of the cumulative mass distribution), namely

(b_1) as particles of 0.2–0.6 μm, in a proportion of 60–95% by weight, based on polybutadiene, and

(b_2) as particles of 2–8 μm, in a proportion of 40–5% by weight, based on polybutadiene, with or without

C. conventional additives, in effective amounts, in which final molding material the polymer or copolymer (b_1) has a capsule particle morphology and the polymer or copolymer (b_2) has a cell particle morphology, a coil particle morphology or a cell and coil particle morphology.

4,493,923

HIGH NOTCHED IMPACT TOUGHNESS PROPYLENE POLYMER COMPOSITIONS

J. Douglas McCullough, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1984, Ser. No. 593,998
Int. Cl.³ C08L 53/00, 23/16, 23/04
U.S. Cl. 525—88 39 Claims

1. A composition having a melt flow between about 5 and about 50 dg/min (ASTM D1238-Condition L), and a high notched impact value, said composition being obtained by peroxide-contacting the blend of 50–95% by weight of an impact-improved propylene-ethylene copolymer, 2 to 45% by weight of a high density ethylene homopolymer, and 2–45% by weight of a linear low density ethylene copolymer and 1 to 30% by weight of a rubber selected from the group consisting of ethylene-propylene rubber and ethylene-propylene-diene monomer rubber, wherein:

(a) said impact-improved propylene-ethylene copolymer has a melt flow (ASTM D1238-Condition L) of about 0.5 to 15 dg/min and an elastomeric propylene-ethylene copolymer content of 5–50% by weight, the copolymer fraction having an ethylene content of 30–95% by weight, which propylene polymer is the product of sequential polymerization of propylene and a propylene-ethylene mixture over a titanium halide-containing coordination catalyst;

(b) said high density ethylene homopolymer has a density in the range from 0.941 to 0.965 g/cc and a melt index (ASTM D1238 Cond. E) in the range from 0 to 20 dg/min;

(c) said linear low density ethylene copolymer is the product of polymerization of ethylene with up to 15 mole percent of at least one C_3–C_8 alpha olefin monomer over a transition metal-based coordination catalyst and which has a density in the range from 0.912 to 0.935 g/cc and a melt index (ASTM D 1238-Condition E) in the range from 1 to 16; and

(d) the weight ratio of high density ethylene homopolymer to linear low density ethylene copolymer is between 80:20 and 20:80.

4,493,924

WATER-CURABLE, SILANE MODIFIED CHLOROSULFONATED OLEFINIC POLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

Mahmoud R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 10, 1983, Ser. No. 501,301
Int. Cl.³ C08F 8/00, 8/38
U.S. Cl. 525—102 34 Claims

1. A composition of matter comprising a chlorosulfonated olefinic polymer and a hydrolyzable silane having a cyclic oxygen, cyclic sulfur or cyclic nitrogen functionality.

4,493,925

RUBBER COMPOSITIONS AND METHOD FOR TREATING RUBBER WITH HYDROXYMETHYL SULFINIC SALTS

Chester D. Trivette, Jr., Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 20, 1982, Ser. No. 409,786
Int. Cl.³ C08C 4/00, 19/20
U.S. Cl. 525—353 37 Claims

1. A composition comprising diene rubber containing a modifying amount of a salt of hydroxymethylsulfinic acid and also containing carbon black or a non-black filler selected from clay, talc, silica and calcium carbonate.

31. A composition comprising polyisoprene containing a modifying amount of a salt of hydroxymethylsulfinic acid.

4,493,926

DISSOCIATING IONICALLY CROSS-LINKED SILOXANE POLYMERS

Robert E. Williams, Jr., Scotia, and John R. Campbell, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,019
Int. Cl.³ C08F 283/00
U.S. Cl. 525—474 11 Claims

1. A method of solubilizing zwitterionic siloxane polymers having ionic cross-links provided by zwitterions of the formulas:

$$-NH^{+}-R-COO^{-} \text{ and } -NH^{+}-R-SO_3^{-}$$

wherein R is a divalent hydrocarbon radical of from 2 to 20 carbon atoms, said method comprising adding a base to a combination of said ionically cross-linked zwitterionic siloxane polymers and an organic solvent, said base being capable of dissociating the ionic cross-links without attacking the siloxane polymer backbone.

4,493,927

CONDENSATION POLYMERS OF SULFUR COMPOUNDS AND NORBORNENYL COMPOUNDS

Kathleen M. McCreedy, Midland, and Kenneth R. Hilton, Harrison, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1983, Ser. No. 564,522
Int. Cl.³ C08G 75/00
U.S. Cl. 528—381 11 Claims

1. A condensation polymer comprising the product of a (1) sulfide salt containing from 1 to about 5 sulfur atoms and (2) a dihaloacetate substituted compound having alicyclic unsaturation in an amount sufficient to improve the high temperature char of the polymer when said polymer is subject to a heat source; and wherein said polymer comprises a backbone containing carbon atom(s) alternating with sulfur atom(s) in recurring units.

4,493,928

CROSSLINKED CHITIN DERIVATIVES

Junichi Koshugi, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Division of Ser. No. 132,787, Mar. 24, 1980, Pat. No. 4,373,096.
This application Jun. 22, 1982, Ser. No. 390,832
Claims priority, application Japan, Apr. 6, 1979, 54-41812
Int. Cl.³ C08B 37/08
U.S. Cl. 536—20 4 Claims

4. A process for preparing a crosslinked derivative of chitin comprising,

crosslinking chitin or regenerated chitin by a crosslinking agent selected from the group consisting of compounds repesented by the general formula:

$$X-(CH_2)_n-\underset{\diagdown\,/}{CH}-CH_2 \text{ or } X-(CH_2)_n-\underset{Y}{\overset{|}{CH}}-\underset{Z}{\overset{|}{CH_2}}$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad Y$$

wherein

X is an atom of chlorine or bromine;

Y is an atom of oxygen or sulfur;

Z is a hydroxyl- or a thiol group and

n is an integer of 1, 2 or 3,

carboxylating the thus crosslinked chitin or crosslinked regenerated chitin with an etherifying agent selected halogenocarboxylic acids represented by the formula, $X-(CH_2)_n-COOH$ wherein X represents an atom of chlorine or bromine and

n is an integer of 1, 2 or 3, and

de-acetylating the thus carboxylated crosslinked chitin with an aqueous 4 to 15N alkali solution at a temperature of 65° to 150° C. for 0.1 to 48 hours to obtain said crosslinked derivative of chitin of a degree of crosslinking of 0.01 to 0.3, a degree of carboxylation of 0.1 to 0.9 and a degree of de-acetylation of 0.1 to 1.0 per N-acetylglucosamine unit.

4,493,929

PREPARATION OF 2-ALKYLPYRIMIDINES

Richard G. Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 301,684, Sep. 14, 1981, abandoned. This application Jan. 18, 1983, Ser. No. 458,812
Int. Cl.³ C07D 239/26
U.S. Cl. 544—242 5 Claims

1. A process for making 2-alkylpyrimidines which comprises dehydrogenating a 2-isopropyl- or 2-tertiarybutyltetrahydropyrimidine in a vapor phase reactor in the absence of oxygen and in which no water is added over a supported noble metal catalyst.

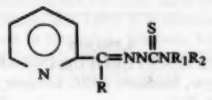
4,493,930

MEDICINAL 2-ACETYL- AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES AND PREPARATION THEREOF

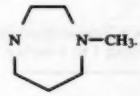
Daniel L. Klayman, Chevy Chase; John P. Scovill, Rockville; Joseph F. Bartosevich; Carl J. Mason, both of Silver Spring, all of Md., and T. Scott Griffin, Orange, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 4,247, Jan. 4, 1979, Pat. No. 4,317,776.
This application Oct. 14, 1981, Ser. No. 311,371
Int. Cl.³ C07D 401/12; A61K 31/495
U.S. Cl. 544—360 11 Claims

1. A compound of the formula



or a pharmaceutically-acceptable acid addition salt thereof wherein R is methyl or ethyl; and R_1 and R_2 are taken together with the nitrogen atom to which they are attached to form a heterocyclic ring selected from the group consisting of homopiperazinyl; homopiperazinyl substituted with alkyl; piperazinyl; or piperazinyl substituted with alkyl, dialkyl, phenyl, COO alkyl, trifluoromethylphenyl, halophenyl, benzyl, or pyridyl; or



4,493,931

PROCESS FOR THE PREPARATION OF β-CYCLO-SUBSTITUTED ETHYLAMINES

Isaac Chekroun, Toulouse, and Alain Heymes, Sisteron, both of France, assignors to Sanofi, Toulouse, France

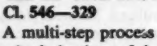
Filed Jun. 29, 1982, Ser. No. 393,383

Claims priority, application France, Jun. 30, 1981, 81 13065

Int. Cl.³ C07D *213/18*; C07C *85/24, 87/28, 333/28*

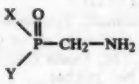
U.S. Cl. 546—329 **11 Claims**

1. A multi-step process for the preparation of β-cyclo-substituted ethylamines of the formula:



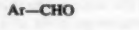
(I)

in which Ar is selected from the group consisting of thienyl, furfuryl, pyridyl, phenyl and mono- or disubstituted thienyl, furfuryl, pyridyl, naphthyl and phenyl, wherein the substituent is selected from the group consisting of halogen nitro, amino, cyano, carboxyl, lower alkyl, halooweralkyl, lower alkoxy, halooeralkoxy and phenyl, which comprises condensing a compound of the formula:



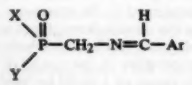
(II)

in which X and Y, which may be the same or different, are lower alkyl, aryl, lower alkoxy, aryloxy, diloweralkylamino or diarylamino radicals, with a carbonyl compound of the formula:



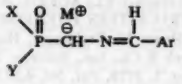
(III)

in which Ar is as hereinbefore defined, to give a compound of the formula:



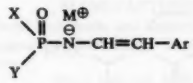
(IV)

in which X, Y and Ar are as hereinbefore defined, treating the resultant compound with a base of the formula B^-M^+ to give a carbanion of the formula:



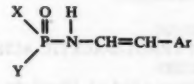
(V)

in which the X, Y and Ar are as hereinbefore described and M is alkyl, alkaline earth or alkali metals, heating the resulting compound so as to form a compound of the formula:



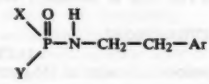
(VI)

in which X, Y, M^+ and Ar are as hereinbefore described, treating the compound formed with water so as to yield a compound of the formula:



(VII)

in which X, Y and Ar are as hereinbefore described, treating the resulting compound with a reducing agent to give a compound of the formula:



(VIII)

in which X, Y and Ar are as hereinbefore described, and then reacting the resulting compound with an acid to give a compound of formula (I).

4,493,932

CHLORINE EXCHANGE FOR FLUORINE IN 2-FLUORO-PYRIDINE COMPOUNDS

John A. Werner, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1982, Ser. No. 417,724

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 **9 Claims**

1. A method of exchanging a chlorine atom for a fluorine atom at the 2-position of a 2-fluoropyridine compound which comprises contacting a 2-fluoropyridine compound with an effective amount of HCL in the absence of a catalyst at a pressure of from about 5 psig to about 400 psig and an elevated temperature of from about 50° C. to about 200° C.

4,493,933

MANUFACTURE OF ANTIBIOTICS

Alastair C. Brodie, Ickenham, England, assignor to Glaxo Group Limited, London, England

Filed Nov. 12, 1982, Ser. No. 441,247

Claims priority, application United Kingdom, Nov. 13, 1981, 8134358

Int. Cl.³ C07D *277/40*

U.S. Cl. 548—194 **5 Claims**

1. Crystalline (Z)-2-(2-t-butoxycarbonylprop-2-oxyimino)-2-(2-triphenylmethylaminothiazol-4-yl)acetic acid in association with 0.1 to 0.6 moles of dioxan per mole of acid.

4,493,934

2(3-AMINO-2-OXOPYRROLIDIN-1-YL) ACETIC ACID AND N-ACYLATED DERIVATIVES THEREOF

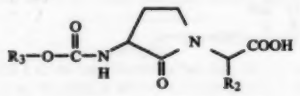
Daniel F. Veber, Ambler, and Roger M. Freidinger, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 80,844, Oct. 1, 1979, Pat. No. 4,377,515. This application Sep. 22, 1982, Ser. No. 421,594

Int. Cl.³ C07D 207/273

U.S. Cl. 548—550 **3 Claims**

1. A compound of the formula:



wherein:

R_2 is C_{1-4} alkyl; and

R_3 is C_{1-12} alkyl; or C_{1-4} aralkyl.

4,493,935

PREPARATION OF 1H-PYRROL-2-ACETIC ACID ESTERS

Winfried Orth, Hassloch, and Werner Fickert, Mannheim, both of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Fed. Rep. of Germany

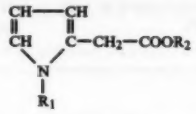
Continuation-in-part of Ser. No. 338,330, Jan. 11, 1982, abandoned. This application Feb. 2, 1984, Ser. No. 576,202

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145510

Int. Cl.³ C07D 207/337

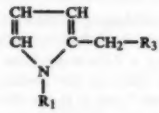
U.S. Cl. 548—562 **11 Claims**

1. A process for the preparation of esters of 1H-pyrrol-2-acetic acids of the formula



I

wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R_2 is selected from the group consisting of alkyl of 1 to 4 carbon atoms and aralkyl of 1 to 4 alkyl carbon atoms comprising reacting a compound of the formula



wherein R_3 is selected from the group consisting of —CN and —

in water with a saponification base wherein the saponification base is added gradually to the 1H-pyrrol-2-acetonitrile and/or 1H-pyrrol-2-acetamide to selectively saponify the same to obtain a substantially isomer free salt of 1H-pyrrol-2-acetic acid, adding alkali metal bicarbonate to the solution to keep the pH of the solution at about 10.2 to 10.5 and reacting the salt of 1H-pyrrol-2-acetic acid without isolation and without removal of any water with a solution of an alkylating or aralkylating agent to introduce the R_2 group in an organic water-insoluble solvent in the presence of a phase transfer agent to obtain the ester of formula I.

4,493,936

2-CYANO-TETRAHYDROFURAN-5-METHANOLS

Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 388,048, Jun. 14, 1982, Pat. No. 4,439,225. This application Jan. 9, 1984, Ser. No. 569,379

Int. Cl.³ C07D 307/22

U.S. Cl. 549—474 **4 Claims**

1. A compound of the formula

wherein R^1 and R^2 each independently is a hydrogen atom or an alkyl group containing 1 to 6 carbon atoms.

4,493,937

2-DIMETHYLAMINO-2-PARAHYDROXYPHENYL SODIUM ACETATE, PREPARATION PROCESS AND APPLICATION THEREOF TO PRODUCTION OF PARAHYDROXYBENZYL CYANIDE

Philippe Gallois, Fosses, and Yani Christidis, Paris, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Dec. 9, 1982, Ser. No. 448,093

Claims priority, application France, Dec. 23, 1981, 81 24104

Int. Cl.³ C07C 99/00

U.S. Cl. 562—444 **4 Claims**

1. A process for preparing a crystallized 2-dimethylamino-2-parahydroxphenyl acetic compound comprising hot reacting parahydroxymandelic acid with an excess of dimethylformamide in the presence of a catalytic quantity of a strong acid and crystallizing the resulting product whereby pure crystallized 2-dimethylamino-2-parahydroxyphenylacetic acid is obtained, and reacting said product with a hydrochioride agent whereby the corresponding hydrochloride compound is obtained; or reacting said acid product with sodium hydroxide and crystallizing the resulting product whereby the corresponding sodium crystallized acetate is obtained.

4,493,938

METHOD FOR THE PRODUCTION OF THIOALKYLENE GLYCOLS

Kunihiro Shimamoto, Otsu; Hiroshi Hatanaka, Takasago; Shinichiro Seki, Otsu, and Ryozo Orita, Himeji, all of Japan, assignors to Toyo Kasei Kogyo Co., Ltd., Osaka City, Japan

Filed Apr. 10, 1981, Ser. No. 253,144

Claims priority, application Japan, Apr. 15, 1980, 55-49745

Int. Cl.³ C07C 149/00, 148/04

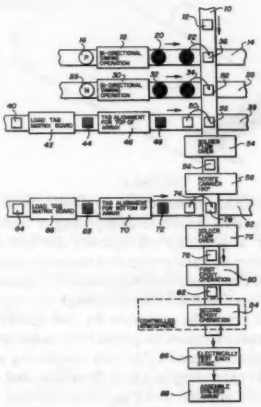
U.S. Cl. 568—62 **7 Claims**

1. A method for the production of thioalkylene glycols which consists essentially of introducing hydrogen sulfide into a reaction system containing a reaction solvent containing mainly a thioalkylene glycol, which is the same as the thioalkylene glycol produced, and an anion exchange resin as a catalyst, said hydrogen sulfide being introduced in amounts sufficient to saturate the thioalkylene glycol solvent and then introducing alkylene oxide in amounts sufficient to react with the hydrogen sulfide to produce the objective thioalkylene glycol, said hydrogen sulfide being maintained in the reaction system in amounts sufficient to saturate the thioalkylene glycol solvent as well as to react with the alkylene oxide and wherein the reaction is carried out at a temperature in the range of 0° to 100° C. and at a pressure in the range of 1 to 10 kg/cm^2, said reaction solvent being used in amounts sufficient to remove the heat of reaction from the reaction system, thus controlling the reaction temperature so as to operate the system under relatively constant and stable reaction temperature conditions.

4,493,939
METHOD AND APPARATUS FOR FABRICATING A THERMOELECTRIC ARRAY

T. Allen Blaske, Plano, and Terry J. Hendricks, Garland, both of Tex., assignors to Varo, Inc., Garland, Tex.

Filed Oct. 31, 1983, Ser. No. 547,066
Int. Cl.³ H01L *35/28*
U.S. Cl. 136—212 43 Claims



1. A method of fabricating a thermoelectric device comprising:

simultaneously depositing a plurality of first conductivity type thermoelements in a matrix member in a first spaced apart configuration;

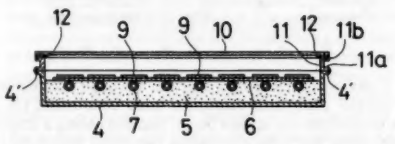
simultaneously depositing a plurality of second conductivity type thermoelements in the matrix member in a second spaced apart configuration to form an alternately disposed array of first and second conductivity type thermoelements within the matrix member; and

depositing and securing in a predetermined pattern a plurality of conductive members on opposite sides of said array of first and second type thermoelements in order to connect the thermoelements in series.

4,493,940
SUNLIGHT-INTO-ENERGY CONVERSION APPARATUS

Daizo Takaoka, Takatsuki, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 9, 1983, Ser. No. 521,604
Claims priority, application Japan, Aug. 13, 1982, 57-141525
Int. Cl.³ H01L *31/04;* F24J *3/02*
U.S. Cl. 136—248 8 Claims

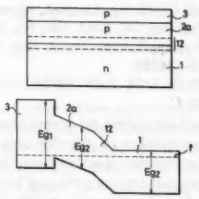


1. A sunlight-into-electrical and thermal energy conversion apparatus of the type comprising a cubiform container open at the top, a heat insulating material disposed in said container, a heat collecting plate received in said container, said heat collecting plate having a heating medium tube on its lower surface in thermal communication with said heat insulating material and solar cells on its upper surface, and a glass plate secured to said container over the open top thereof, the improvement comprising a metal sealing collar disposed between the glass plate and the periphery of the open top of the cubiform container, frit glass between said glass plate and said sealing collar for sealing said collar to said glass plate, the coefficients of thermal expansion of the metal collar and the glass plate being about equal, and the sealing collar and the periphery of the open top of the cubiform container being sealed together by welding or soldering.

4,493,941
HETERO-FACE SOLAR CELL AND METHOD OF MANUFACTURING THE SAME

Yoshinori Yukimoto, and Kotaro Mitsui, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,903
Claims priority, application Japan, Aug. 24, 1982, 57-148062
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—255 5 Claims



1. A solar cell, comprising:

a semiconductor substrate of a first conductivity type;

a first semiconductor layer of a second conductivity type formed on said semiconductor substrate, said first semiconductor layer having a forbidden band-gap equivalent to that of said semiconductor substrate;

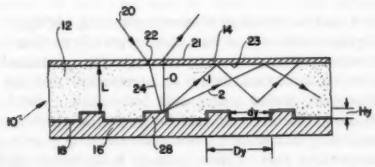
a second semiconductor layer of said second conductivity type having a forbidden band-gap wider than that of said first semiconductor layer formed on said first semiconductor layer;

an impurity concentration of a second conductivity type impurity being gradiently distributed in said first semiconductor layer so as to form an accelerative electric field in the direction of the junction between said first semiconductor layer and said substrate, said impurity concentration gradiently decreasing from the surface mating with said second semiconductor layer to the junction with said substrate.

4,493,942
SOLAR CELL WITH TWO-DIMENSIONAL REFLECTING DIFFRACTION GRATING

Ping Sheng, Skillman, and Robert S. Stepleman, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1983, Ser. No. 458,885
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—259 7 Claims



1. A solar cell comprising:

(a) an active layer of semiconductor material having a pair of opposed surfaces,

(b) a two-dimensional diffraction grating fixed to one of said surfaces of said active layer, coated with a layer of reflecting material at the interface between said grating and said active material, the profile of the interface between said grating and said active layer being described by $H(x,y)=\alpha(X)+\beta(y)$ where $H(x,y)$ is the height of the grating measured from a reference plane having independent x and y axes and $\alpha(x)$ and $\beta(y)$ are periodic rectangular-wave functions in x and y, respectively.

4,493,943

ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokohama; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Sep. 16, 1983, Ser. No. 533,263

Claims priority, application Japan, Sep. 16, 1982, 57-161520; Jul. 12, 1983, 58-126559

Int. Cl.³ H01B *3/24, 9/06;* **H01F** *27/12;* **H01G** *4/22*

U.S. Cl. 174—25 C **15 Claims**

1. An electrical insulating oil comprising:

(a) at least one member of diarylalkanes, and

(b) at least one member selected from the group of monoolefins, diolefins and mixtures thereof having two condensed or noncondensed aromatic nuclei, excluding bicyclic monoolefins of unsaturated dimers and unsaturated codimers of styrenes such as styrene, α-methylstyrene and their monomethyl nuclear substituted compounds.

4,493,944

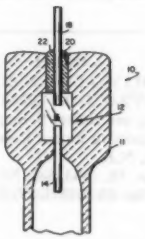
SOLDER GLASS AND ELECTRICAL DEVICE EMPLOYING SAME

Richard G. Snell, Topsfield, and Fredrick A. Loughridge, Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1984, Ser. No. 568,029

Int. Cl.³ H01T *5/00;* **H05K** *5/06*

U.S. Cl. 174—50.64 **2 Claims**



2. A seal for electrical devices comprising a body of substantially fused silica and at least one electrically conductive member sealed therein, said member comprising a proximal portion projecting within said body, an intermediate thin foil portion hermetically sealed within said body, and a distal portion projecting exteriorly of said body, and a capillary passage surrounding said distal portion and extending to said intermediate portion, said capillary passage being substantially filled with a solder glass comprising: about 65 weight percent Sb_2O_3; about 30 weight percent B_2O_3; and about 5 weight percent PbO.

4,493,945

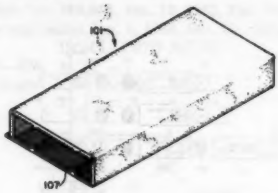
THERMAL PROTECTIVE SYSTEM

Rubin Feldman, St. Louis County, Mo., assignor to Thermal Science, Inc., St. Louis, Mo.

Filed Aug. 23, 1982, Ser. No. 410,454

Int. Cl.³ H02G *3/04;* **B32B** *3/30*

U.S. Cl. 174—68 C **20 Claims**



1. A thermal protective structure applied over a substrate, the thermal protective structure comprising a mesh support structure having a plurality of spacers formed integrally therein and an active thermal protective material applied to the support structure, the active thermal protective material forming a continuous layer which is held, through the major part of its extent, spaced from the substrate by the spacers and responding to thermal extremes to protect the substrate.

17. In combination, a metal cable tray containing a plurality of electrical cables extending in a first direction, and a thermal protective structure applied as an envelope around the cable tray, the thermal protective structure comprising a mesh support structure having a plurality of spacers formed integrally therein, said spacers comprising stiffening ridges, said integral spacers extending transverse to said first direction, and an active thermal protective material applied in a continuous layer to the support structure, the active thermal protective material being held, through the major part of its extent, spaced from the cable tray by the integral spacers and responding to thermal extremes to protect the cable tray.

4,493,946

DEVICE FOR CONNECTING TOGETHER THE OUTER CONDUCTORS OF TWO COAXIAL PAIRS

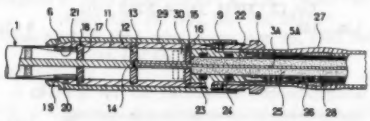
Jean Duret, Lyons, France, assignor to Les Cables de Lyon, Lyons, France

Continuation of Ser. No. 123,245, Feb. 21, 1980, abandoned. This application Mar. 9, 1983, Ser. No. 471,905

Claims priority, application France, Feb. 23, 1979, 79 04658

Int. Cl.³ H02G *15/18*

U.S. Cl. 174—88 C **2 Claims**



1. A device for connecting together the outer conductors of two coaxial pairs with respective axial conductors (3) and outer conductors (4), at least one of said pairs being a length of coaxial cable, said device including two metal half-shells (11), said half-shells having externally chamfered ends (10) which are provided with longitudinal slots, said half-shells being disposed between the ends of the outer conductors, a sleeve (6) covering said half-shells and having one end (7) tapped and threaded, and a clamping screw (8) fitted onto the corresponding outer conductor and being screwed into said one end of the sleeve and bearing on a conical ring (9) to clamp said one end of each half-shell, the improvement wherein the inside of the other end of said sleeve is machined to give it a fustoconical profile (19) whose conical shape substantially matches that of

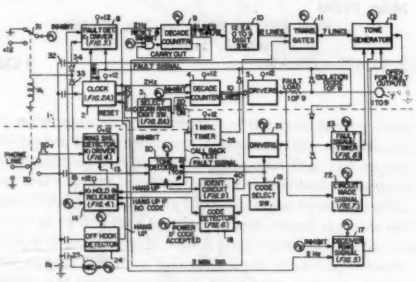
the corresponding chamfered ends (20) of the half-shells, and wherein said device connects said coaxial cable to a flexible lead repeater comprising a coaxial pair of smaller diameter, and wherein said device includes a metal end member (22) to the smaller diameter coaxial pair side which fits into the ends of the half-shells, said end member being provided with internal gas-tight seals (23) and an adhesive heat-shrinkable sheath (27) which surrounds the end of said end member which is opposite to the half-shells.

4,493,947

SECURITY DEVICE UTILIZING CONVENTIONAL TELEPHONE LINES

John H. Loveless, 2566 Salem Bottom Rd., Westminster, Md. 21157

Filed Oct. 6, 1981, Ser. No. 309,227
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—2 A 15 Claims



1. A security device connected to telephone lines and to at least one sensor, comprising:

monitoring means for monitoring said at least one sensor to determine a status of each said at least one sensor and to detect when said status of any sensor is a fault status;

preselecting means operable by a user of the security device for preselecting at least one telephone number to be called upon occurrence of said fault status;

automatic call-up means for automatically calling said preselected telephone number to report any said fault status;

answering circuit means for receiving and answering an incoming telephone call received over said telephone lines, and responsive to reception of a user input transmitted over the telephone lines and designating a selected said at least one sensor to be monitored for monitoring said at least one sensor, and for transmitting the status of said selected at least one sensor over the telephone lines; and

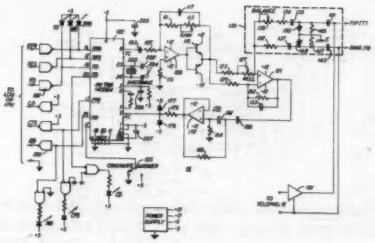
identification circuit means responsive to a received user query, requesting the identity of the security device, for transmitting identification information over the telephone line; wherin said identification circuit means comprises a counter for counting through a plurality of count outputs, a digital switch having multiple stages, each preset with a digit of an identifier, and a tone generator for selectively generating a pluraliyt of tones, said multiple stages of said digital switch being responsive in turn to respective count outputs for sequentially activating said tone generator to generate corresponding sequential tones, whereby to transmit said identification information.

4,493,948

TRANSPARENT SECONDARY INFORMATION TRANSMISSION SYSTEM FOR AN INFORMATION TRANSMISSION SYSTEM

John M. Sues, Absecon, N.J., and Carmine Cupani, Bronx, N.Y., assignors to The Inteleplex Corporation, Atlantic City, N.J.

Filed Jun. 27, 1983, Ser. No. 508,126
Int. Cl.³ H04M *11/06*
U.S. Cl. 179—2 A 30 Claims

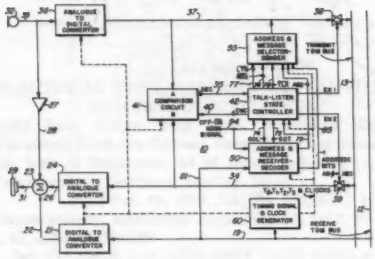


1. A condition monitoring system adapted to be connected in a telephone system comprising circuit means for monitoring at least one condition at a first location in the telephone system and providing a first signal representative of the condition, first means adapted to be coupled to a pair of ring and tip lines of the telephone system at the first location and to earth ground for transmitting substantially said first signal simultaneously on both said ring and tip lines such that substantially no signal is produced across said ring and tip lines from transmission of said first signal on both said ring and tip lines, second means adapted to be coupled to the ring and tip lines at the second location and earth ground for transmitting substantially a second signal simultaneously on both said ring and tip lines such that substantially no signal is produced across said ring and tip lines from transmission of said second signal on both said ring and tip lines and for receiving said first signal at said second location in the telephone system and generating a signal responsive to a predetermined condition of said first signal, said first means further comprising balanced modulator/demodulator means for receiving said second signal from said second location transmitted on said ring and tip lines, said first balanced modulator/demodulator means further comprising modulator means for converting said first signal into a modulated signal, amplifier means for increasing the amplitude of said modulated signal so as to produce an amplified modulated signal, said amplified modulated signal present on an output of said amplifier means, said output coupled to telephone line coupling means, said telephone line coupling means comprising resistor/capacitor circuit means coupled to both said ring and tip lines of said telephone system for coupling said amplified modulated signal to both said ring and tip lines and further comprising means for adjusting said amplified modulated signal so that said amplified modulated signal is substantially undetected across said ring and tip lines but may be detected across either of said ring and tip lines and earth ground, whereby said first means for transmitting is substantially transparent to said telephone system, and further comprising duplexer means coupled to the output of said amplifier means and to said telephone line coupling means, said duplexer means having an output coupled to filter means, said duplexer means allowing said second signal received by said telephone line coupling means to be coupled to said filter means, and further comprising demodulator means for converting said received signals into a demodulated signal, said filter means coupled to said demodulator means, said demodulated signal coupled to said circuit means for controlling said circuit means.

4,493,949
PARALLEL OPERATION OF TELEPHONE EQUIPMENT ON A DIGITAL LOOP

Laurence J. Retallack, Ottawa, and Cornelis W. Reedyk, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 12, 1981, Ser. No. 242,843
Int. Cl.³ H04M 3/56
U.S. Cl. 179—18 BC **24 Claims**

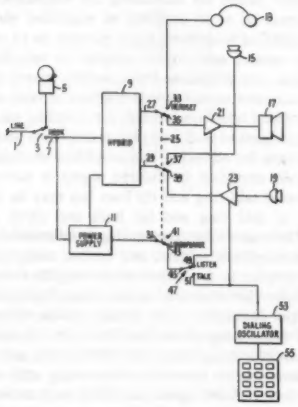


1. A digital station apparatus for connection to a subscriber's digital telephone loop, having both receive channels and transmit channels, said apparatus characterized by:
terminal means for receiving digital signals from said receive channels;
first switch means for selectively passing first digital signals from a first channel of said transmit channels;
second switch means for selectively passing second digital signals to said first channel of said transmit channels such that said first and second switch means operate in unison and one said switch means is open when the other said switch means is closed; and
a comparison means for comparing said first digital signals and said second digital signals, when said first switch means is closed, and for producing a signal indicative of said comparison.

4,493,950
LOUDSPEAKER TELEPHONE

Thomas M. Lott, 55 W. Santa Inez Ave., San Mateo, Calif. 94402

Filed Dec. 17, 1982, Ser. No. 434,865
Int. Cl.³ H04M 9/08
U.S. Cl. 179—81 B **1 Claim**

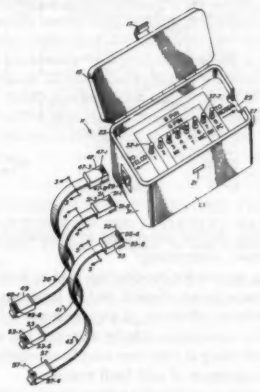


1. A line powered telephone receiver and transmitter which is capable of being operated in a handset mode and in a loudspeaker mode comprising in combination:
(a) a lightweight headphone and first microphone,
(b) a loud speaker and second microphone,
(c) an amplifier for said loudspeaker,
(d) an amplifier for said second microphone,
(e) a hybrid circuit for separating incoming from outgoing signals,
(f) a power supply operated by telephone line current,
(g) a three pole double throw switch,
(h) a single pole double throw switch
(i) said three pole switch having one position connecting said headset and said first microphone to said hybrid circuit and a second position connecting said power supply to the center pole of the single pole switch and said hybrid circuit to the loudspeaker and second microphone, and
(j) said second switch having a listen position activating said loudspeaker amplifier and a talk switch actuating said second microphone amplifier.

4,493,951
DEVICE FOR USE IN TESTING A MODEM COUPLED TO A TELEPHONE LINE BY MODULAR CONNECTORS

Edward Sanderson, 40 Crestwood Dr.; Laurence S. Sanderson, 13 Mayflower Rd., both of Framingham, Mass. 01701, and Robert S. Kalinowski, Jr., 22 C Beacon Village, Burlington, Mass. 01803

Filed Apr. 18, 1983, Ser. No. 486,260
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.3 F **9 Claims**



1. A device for use in testing the wiring integrity and/or determining the location of system faults for a modem and/or an associated telephone line which are coupled together through a modular plug on the modem and a modular jack on the telephone line, the device comprising:
a. a housing,
b. a first multi-contact modular jack mounted on said housing and adapted to receive said modular plug on said modem,
c. a second multi-contact modular jack mounted on said housing,
d. a set of conductors connecting the contacts on said second multi-contact modular jack with the contacts on said first multi-contact modular jack,
e. a test pin connected to each conductor and projecting outward therefrom, and
f. a connector cable having a first multi-contact modular plug on one end adapted to be plugged into said second multi-contact modular jack and a second multi-contact modular plug on the other end adapted to be plugged into said modular jack on said telephone line,

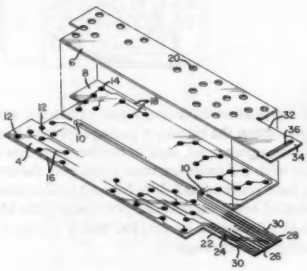
g. whereby, said device may be coupled in series between said modem and said telephone line and tests conducted through said test pins.

4,493,952

MEMBRANE SWITCH HAVING INTEGRAL SWITCH TAIL INSULATOR

Richard H. Kaleida, Salem, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1983, Ser. No. 527,042
Int. Cl.³ H01H *13/70*; H05K *1/00*
U.S. Cl. 200—5 A **12 Claims**



1. A membrane switch assembly of the type having three parallel layers, the three layers comprising first and second parallel insulating supports having opposed first and second surfaces and a spacer between the first and second surfaces, at least one of the supports being a flexible layer, opposed switch electrodes at switch sites on the first and second surfaces and openings in the spacer at the switch sites, circuit conductors on the one support which is a flexible layer extending between and among the switch electrodes of the one support, an integral tail extending from the one support, the tail having a free end and having an end portion which is adjacent to the free end, the circuit conductors having lead portions which extend onto one surface of the tail and substantially to the free end of the tail, and a tail insulator in covering and insulating relationship to the lead portions, the tail insulator extending to the end portion of the tail so that contact portions of the lead conductors on the end portion of the tail are exposed, the membrane switch assembly being characterized in that:

the assembly comprises a second flexible layer, the second flexible layer being one of the layers other than the flexible membrane which has the integral tail,

the second flexible layer has an integral tail insulator extending therefrom, the tail insulator being substantially coextensive with the tail and being in covering relationship to the one surface of the tail, the tail insulator having a free end, a slot is provided in the tail insulator adjacent to the free end of the tail insulator, the slot extending normally of the side edges of the tail insulator, the free end of the tail being threaded through the slot, the end portion of the tail extending beyond the slot and beside the tail insulator whereby the contact portions only of the lead portions of the conductors are exposed,

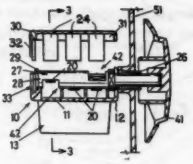
the tail and the tail insulator having opposed edges at the slot in the tail insulator, the opposed edges preventing movement of the tail insulator along the tail towards the second flexible layer whereby the tail and the tail insulator are maintained in side-by-side relationship with the tail insulator in covering relationship to the lead portions of the conductors.

4,493,953

SWITCH

Damon J. F. Bound, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty. Ltd., South Australia, Australia

Filed Aug. 15, 1983, Ser. No. 523,158
Claims priority, application Australia, Aug. 23, 1982, PF5516
Int. Cl.³ H01H *19/60, 3/42*
U.S. Cl. 200—6 B **4 Claims**



1. A switch comprising a body and a cap, and resilient latch means depending from the cap and engaging latch surfaces on the body thereby retaining the cap to the body,

the body containing terminal recesses which themselves house respective terminal plates, each said terminal recess being defined by surfaces having lugs projecting therefrom into that recess, said terminal plates being engaged and retained by said lugs in their respective said recesses, said body also supporting a switch shaft bearing, there being a switch actuating shaft rotatable in said bearing and projecting from the body, a plurality of contact fingers on one of said terminal plates and respective contact members on each other said plate, said switch actuating shaft having transversely extending slots therein, each of which, when aligned with a respective said contact finger, permits movement of that contact finger into electrical contact with a said contact member, said movement being effected by resilience of that contact finger,

the cap engaging the switch shaft and terminal plates when assembled to the body, and further retaining the switch shaft and terminal plates in their positions within the body.

4,493,954

ROTARY SWITCH WITH INTERNAL ROTOR INTERCONNECTING CIRCUIT PATHS FOR SURFACE CONTACTS

David J. Kimmel, and John H. Lauterbach, both of Clearwater, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 6, 1983, Ser. No. 456,070
Int. Cl.³ H01H *19/58, 21/78*
U.S. Cl. 200—11 R **12 Claims**

1. A rotary switch of the type comprising:

a housing of insulative material defining a cavity;

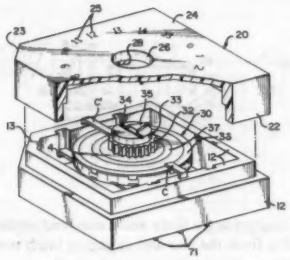
a substantially cylindrical rotor mounted for relative rotation within said cavity of said housing;

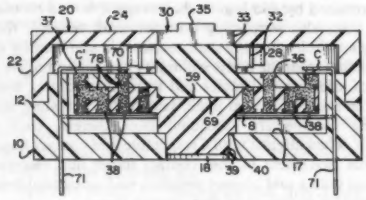
a plurality of fixed contacts mounted to extend radially into said cavity and from said housing;

a plurality of integral surface contacts in said rotor which selectively engage said fixed contacts in said housing, incremental rotation of said rotor causing different sets of surface contacts to selectively engage said fixed contacts, characterized in that said rotor is a disc having opposed first and second planar surfaces, said first planar surface having a plurality of said surface contacts thereon, said surface contacts lying on circles concentric with the central axis of said disc, said surface contacts on said circles further lying along radii common to each said circle, a number of said fixed contacts corresponding to the number of said circles making engagement with said surface contacts along said radii, said radii corresponding to the number of incremental positions of said rotor, and circuit paths extending through and within said rotor intercon-

necting respective surface contacts on the faces of said rotor.

2. A rotary switch as in claim 1 characterized in that at least one of said surface contacts is a circular bus which is in constant engagement with a certain one of said fixed contacts regardless of the incremental position of said rotor, said circular bus being electrically continuous with at least some of said remaining surface contacts by means of said circuit paths.





4,493,955

CONTROL MECHANISM FOR AN ELECTRIC MOTOR ASSEMBLY

Charles D. Wielgus, Crystal Lake, Ill., assignor to Colman OEM, Inc., Rockford, Ill.

Filed Apr. 18, 1983, Ser. No. 486,203
Int. Cl.³ H01H *43/10*
U.S. Cl. 200—38 R 4 Claims

1. A control mechanism in combination with an electric motor assembly which is intermittently operated through cycles of similar duration and in which an output shaft is connected to the electric motor through a gear train located in a housing,

a cam surface formed on the output shaft,

a switch block assembly located on the gear train housing,

a first arm extending from the switch block assembly and having a contact near the free end thereof,

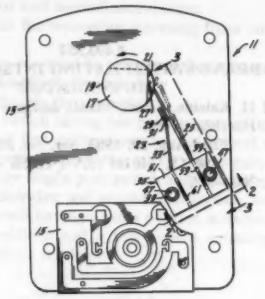
a second arm extending from the switch block assembly and intersecting the free end of the first arm,

the second arm having a cam follower portion which rides on the cam surface of the output shaft and a contact portion which is positioned to be moved into and out of engagement with the contact of the first arm,

the cam surface of the output shaft being contoured so that the contacts of the first and second arms are disengaged when the output shaft begins a cycle of rotation and these contacts are engaged when the output shaft completes a cycle of rotation,

said switch block assembly including a base portion formed integrally with the gear train housing,

the base portion having a pair of posts and a center block located between the posts, and



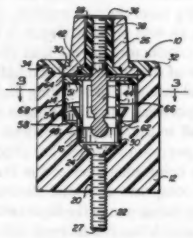
a switch top portion including a pair of blocks, a cross member connecting the blocks, a passage formed in each block which passages are adapted to receive the posts of the base portion with the cross member resting on the center block of the base portion and slots formed in the cross member and located between the base portion and the blocks, with the slots positioned to receive quick connect terminals extending therethrough.

4,493,956

IMPACT SWITCH

Richard E. Yeoman, 2125 Portola La., Westlake Village, Calif. 94014

Filed Aug. 29, 1983, Ser. No. 527,289
Int. Cl.³ H01H *35/14, 29/20*
U.S. Cl. 200—61.47 13 Claims



1. An impact switch assembly, comprising:

(a) a non-conductive housing having a cavity therein,

(b) a first conductive terminal secured to said housing,

(c) a second conductive terminal secured to said housing,

(d) moveable terminal bridging means disposed in said cavity adapted to electrically interconnect said first and second terminals, comprising:

(1) a moveable electrical conductor secured to said housing and disposed in said cavity,

(2) a pool of liquid mercury disposed in said cavity and adapted to electrically connect said second terminal with said conductor,

(3) control means for moving said conductor into and out of electrical contact with said first terminal,

(4) said conductor being positioned to allow the electrical connection of the first terminal and pool of mercury,

(e) whereby an electrical circuit is completed between said terminals when the pool of mercury contacts the conduc-

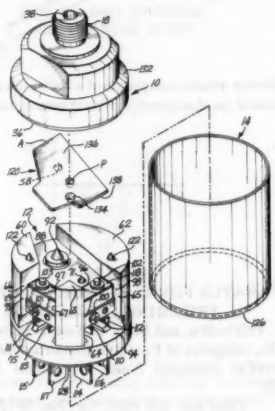
tor and second terminal only when said conductor is in contact with said first terminal.

4,493,957

MULTIMODAL PRESSURE SWITCH

Wayde H. Watters, Kent, Wash., assignor to Red Dot Corporation, Seattle, Wash.

Filed Mar. 11, 1983, Ser. No. 474,702
Int. Cl.³ H01H *35/24, 3/32*
U.S. Cl. 200—81 R **20 Claims**



1. A switch mechanism comprising:
a snap-action switch which in use forms a part of an electrical circuit, said switch having a reciprocating operator;
a movable member with a first side facing toward the reciprocating operator, and a second side essentially opposite said first side;
support means for supporting the movable member by making supporting contact with at least two support points on said second side;
a biasing member which makes point contact with said first side of the movable member at a location that is offset from both the reciprocating operator and said support points;
means for mounting the biasing member for reciprocating movement along a line that includes its point of contact with the movable member and that extends generally transversely of the movable member;
spring means for biasing the biasing member toward the movable member and the movable member into contact with the support means and into a spaced relationship with the reciprocating operator;
a load applying member which makes point contact with said second side of the movable member at a location spaced toward the reciprocating operator from both the biasing member and said support points;
means for supporting the load applying member for movement along a line that includes its point of contact with the movable member and that extends generally transversely of the movable member; and
fulcrum means positioned to contact said first side of the movable member at a location spaced toward the reciprocating operator from the load applying member;
with the relative spacing of the reciprocating operator, said support points, the point of contact between the biasing member and the movable member, the point of contact between the load applying member and the movable member, and the fulcrum means being such that a first movement of the load applying member toward the movable member will pivot the movable member in position about a first axis that includes said support points, to depress the biasing member, compress the spring means, and move the movable member into contact with the reciprocating operator to depress said operator and operate the snap-action switch, and a subsequent additional movement of the load applying member in the same direction will cause the movable member to pivot in position about the fulcrum means, to further depress the biasing member, further compress the spring means, and move the movable member out of contact with the reciprocating operator.

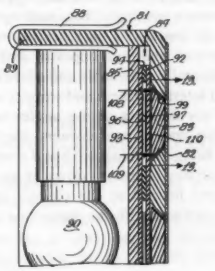
13. A switch mechanism as described in claim 1, further comprising means for receiving a pressure signal and applying it against the load applying member to cause said movements of the load applying member.

4,493,958

ILLUMINATED MEMBRANE SWITCH

Lawrence E. Hamilton, Chicago, and Renzo N. Rutili, Evanston, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 536,637
Int. Cl.³ H01H *9/18*
U.S. Cl. 200—314 **9 Claims**



1. An illuminated membrane switch assembly, comprising; a first transparent flexible film member having a conductive area on one side thereof, a second transparent flexible film member adjacent and normally spaced from the one side of the first film member, said second film member having a conductive area on the side thereof adjacent the first film member and including spaced switch contacts positioned to be electrically closed when simultaneously contacted by the conductive area on the first film member when one of the film members is pressed into engagement with the other film member, a movable switch actuator member mounted adjacent one of the first and second film members having a width greater than the conductive areas and having indicia thereon on the side thereof opposite the first and second film members, a source of light, transmission means for transmitting light from the source through the first and second film members into the side of the actuator member toward the first and second film members, and means for preventing light from passing through the conductive areas into the actuator member.

4,493,959

KEYBOARD WITH IMPROVED KEY DESIGN PERMITTING TILTING ABOUT EITHER SIDE

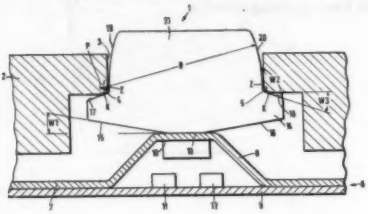
Hans-Joachim Viebrantz, Bad Neustadt/Saale, Fed. Rep. of Germany, assignor to Preh Elektrofeinmechanische Werke Jakob Preh Nachf., GmbH & Co., Bad Neustadt/Salle, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,637

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208559

Int. Cl.³ H01H *13/14*

U.S. Cl. 200—340 8 Claims



1. A keyboard comprising a supporting plate with recesses therein and keys arranged in said recesses, a contact plate positioned below said keys and resilient contact means positioned on said contact plate below each said key for providing a resilient force against said key when it is pressed down against said contact means to make an electrical contact, characterized in that:

each said recess comprises an opening in said plate, said plate having a pair of corners on opposite sides at the bottom of said opening,

each said key has a top portion which normally extends up through said opening and has opposite lateral surfaces which curve inwardly from said opening in going from bottom to top, and a base portion which extends below said corners and has opposite stopper surfaces which extend laterally outwardly and downward from said opening, said lateral surfaces and stopper surfaces on each side of said key defining obtuse angles which normally abut respective ones of said corners, the bottom of said base portion being in contact with said contact means, whereby when said key is pressed down at an angle it tilts about a tilting axis formed at the contact point of one of said stopper surfaces with the respective one of said corners.

4,493,960

CERAMIC BLINDERS FOR A MICROWAVE OVEN QUARTZ LAMP

Robert A. Mittelsteadt, Burnsville, and Gregory W. Machesney, Oakdale, both of Minn., assignors to Micro-Quartz Technology Corp., Minneapolis, Minn.

Filed Aug. 12, 1982, Ser. No. 407,377

Int. Cl.³ H05B *6/80, 3/44*

U.S. Cl. 219—10.55 B 1 Claim

1. In a combination microwave/convection/broiling oven having a cavity, a heat-exchanger/fan, one or more quartz lamps mounted adjacent thereto, each having a quartz tube and a resistance element, and blinder means for directing the propagation of infrared radiation from said quartz lamps, the improvement comprising:

said blinder means comprised of a half-tube of ceramic paper mounted on the interior of said quartz tube.

4,493,961

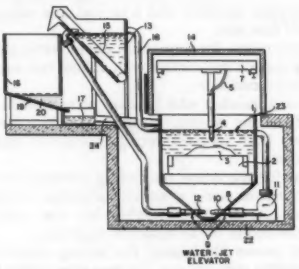
APPARATUS FOR ELECTROHYDROBLASTING TRIMMING OF CASTINGS

Valery V. Prikhodko, and Boris V. Kostyrkin, both of Nikolaev, U.S.S.R., assignors to Proektno-Konstructorskoe Bjuro Elektrogidravliki Adademii Nauk Ukrainskoi SSR, Nikolaev, U.S.S.R.

Filed Apr. 13, 1982, Ser. No. 367,957

Int. Cl.³ B08B *3/10;* B23P *1/06*

U.S. Cl. 219—69 R 11 Claims



1. An apparatus for electrohydroblasting trimming of castings, comprising: a bath in which the castings being trimmed are placed; a working fluid filling said bath, said working fluid having an electrical conductivity required for the electrohydroblasting trimming; a bottom part of said bath which narrows; a working electrode immersed in said working fluid and defining a spark gap with the surface of the castings being trimmed; means for providing current pulses to said spark gap, whereby electrohydroblasting discharges occur in said working fluid so as to remove molding sand from the surface of the castings; means for moving said working electrode with respect to the surface of the castings being trimmed, said electrode being secured to said means; said means for moving the electrode being installed over said bath; a hydraulic elevator for removing sludge formed as a result of removal of molding sand, which is provided in said bottom part of said bath; a tank for settling the solid fraction from said working fluid, communicating with said hydraulic elevator for the transfer of the sludge from said bath to said tank.

4,493,962

APPARATUS AND METHOD TO SUPPRESS OXIDATION DURING RESISTANCE WELDING

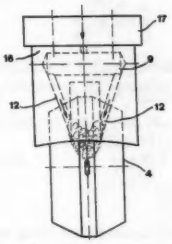
Wolfgang Weil, Hattsteinstr. 3, D-7843 Heitersheim, Fed. Rep. of Germany; Andres Lanz, Obere Dorfstrasse 80, CH-8968 Mutschellen, Switzerland; Max Vogt, 25 Sunset Pl., Singapore 21, Singapore; Paul Meier, Dorngasse 55, CH-8967 Widen; Martin Kaul, Langlcherstr. 204, CH-5454 Bellikon, both of Switzerland, and Hanspeter Fankhauser, 400 Birch La., Irvington, N.Y. 10533

Continuation of Ser. No. 212,593, Dec. 3, 1980, Pat. No. 4,396,821. This application Jan. 17, 1983, Ser. No. 458,754

The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.

Int. Cl.³ B23K *11/08*

U.S. Cl. 219—64 5 Claims



1. In a resistance roller welding machine for seam welding two can components movable in a predetermined direction, including oxidation suppression means operable for at least partially suppressing oxidation of the hot welding seam,

the improvement comprising

gas supply means forming part of said oxidation suppression means having an opening operative for discharging an agitated inert gas therethrough to a location downstream of and near said welding seam, as seen along said predetermined direction,

said gas supply means defining an expansion chamber for agitating and cooling said inert gas prior to discharging it through said opening,

said location including a section free of any sealing means and extending between said can components and said gas supply means within which section there is created an impinging region wherein said inert gas impinges on said hot welding seam and another region wherein said inert gas is in contact with the surrounding atmosphere.

4,493,963

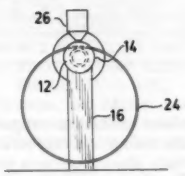
MANDREL MACHINE

Roman Arnoldy, P.O. Box 40472, Houston, Tex. 77240

Filed Sep. 9, 1982, Ser. No. 416,403

Int. Cl.³ B23K *9/04*

U.S. Cl. 219—76.1 7 Claims



1. A machine supporting and rotating a cylindrical or oval metal plate having an opening therethrough which is to have welded to it cladding material, corrosion-resistant material or hardfacing material, welding means being disposed above the machine for welding the material to the plate, the machine comprising

a rotatable substantially cylindrical mandrel for inserting into and supporting the plate, the longitudinal axis of the mandrel disposed horizontally,

the mandrel being receivable within the opening in the plate, the horizontal axis of the mandrel spaced from the horizontal axis of the plate so that the two axes are offset and non-coincident,

the mandrel protruding into the opening in the plate and the outer diameter of the mandrel being less than the inner diameter of the plate so that the mandrel contacts less than the entire inner surface of the plate's opening,

the mandrel contactingly supporting the plate so that no other apparatus is needed to brace or support the plate, and the mandrel holding the plate beneath the welding means so that upon rotation of the mandrel the plate is rotated by the mandrel, the plate being rotated about its horizontal axis past the welding means for welding the material to the plate,

the mandrel supporting the plate to uniformly maintain the distance between the welding means and the part of the plate being welded, and

beam means connected to the mandrel for supporting the mandrel.

6. A method for welding cladding, corrosion-resistant, or hardfacing material to a cylindrical or oval metal plate having an opening therethrough, the method comprising

positioning a rotatable substantially cylindrical mandrel in proximity to welding means, the mandrel's longitudinal axis being positioned horizontally,

placing the plate on the mandrel so that the plate's longitudinal axis is positioned horizontally and so that the mandrel protrudes into the plate's opening contactingly supporting the plate, the mandrel's and plate's horizontal axes being offset and noncoincident, the mandrel contacting less than the entire inner surface of the plate's opening,

rotating the mandrel, thereby rotating the supported plate past the welding means and uniformly maintaining the distance between the welding means and the part of the plate being welded, and

welding the material to the plate.

4,493,964

METHOD OF JOINING ELECTRICALLY CONDUCTIVE MEMBERS

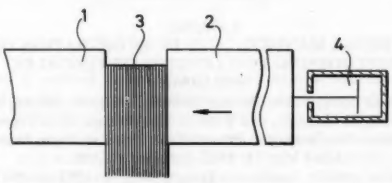
Saito Shigemasa, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 54,052, Jul. 2, 1979, abandoned. This application Sep. 9, 1981, Ser. No. 300,532

Claims priority, application Japan, Jun. 30, 1978, 53-80048; Jun. 30, 1978, 53-80049

Int. Cl.³ B23K *11/20*

U.S. Cl. 219—78.02 5 Claims



1. A solid phase bonding method for joining a plurality of electrically conductive members, made from copper, silver, an alloy of copper or silver, a copper-coated material, silver-coated material or a like material which is used as an electrical switch contact or other conductive element, said method com-

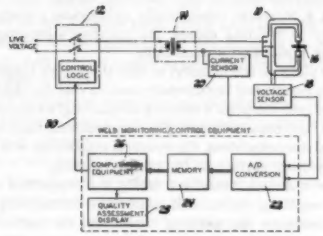
prising the steps of inserting said conductive members in stacked relationship between two carbon electrodes with no adhesive materials between said conductive members, said carbon electrodes having confronting parallel surfaces and disposed in an air atmosphere, heating said conductive members up to a bonding temperature in a period of time on the order of ten seconds, where said bonding temperature falls in a range between 0.4 TM and 0.8 TM where TM represents the melting temperature of any of said conductive members, and maintaining the temperature of said conductive members in the vicinity of said bonding temperature for one to three minutes by feeding electric current between said electrodes while said conductive members are pressurized at a pressure substantially between 0.02 kg/mm^2 and 1 kg/mm^2 between said electrodes.

4,493,965

METHOD AND APPARATUS FOR PREDICTING AND CONTROLLING THE QUALITY OF A RESISTANCE SPOT WELD

Albert F. Houchens, Rochester, Mich.; Dixon Cleveland, Vienna; Basil A. Decina, Jr., McLean, both of Va.; Dale K. Watsey, Troy, Mich.; James R. Havens, Sterling Heights, Mich., and Gregory L. Nagel, Royal Oak, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 25, 1983, Ser. No. 498,061
Int. Cl.^{3} B23K *11/00*
U.S. Cl. 219—109 **12 Claims**



1. A method of predicting the quality of a resistance spot weld comprising the steps of:

measuring the weld resistance and power,

determining from the resistance characteristic and the electrical power the onset of melting,

deriving from the measured power the total energy put into the weld and the energy put into the weld after the onset of melting and

assessing the degree of weld growth by determining the ratio of energy put into the weld after the onset of melting to the total energy and comparing the ratio to an empirical standard ratio representing a good weld whereby the quality of the weld is predicted as good when the measured ratio equals or exceeds the standard ratio.

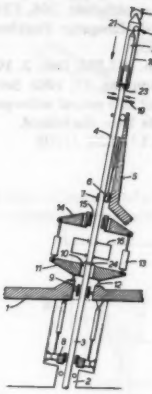
4,493,966

INTERNAL MANDREL USED IN AN OPERATION OF BUTT JOINING TWO LENGTHS OF TUBING BY WELDING

Bruno de Sivry, Paris; Bernard Sudre[illegible], Puteaux; Michel Jegousse, St Herblain, and Yves Le Hir, Nantes, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed May 11, 1982, Ser. No. 376,999
Claims priority, application France, May 13, 1981, 81 09479
Int. Cl.^{3} B23K *15/00*
U.S. Cl. 219—121 EC **15 Claims**

1. Internal mandrel used in carrying out an operation of butt joining two lengths of tubing by welding the ends of said lengths of tubing, which are disposed facing one another and which then define a junction region, said mandrel comprising sensing means capable of detecting the longitudinal position of one of said ends and centering means capable of centering said two ends relative to one another, and welding means for carrying out of the welding operation, the improvement wherein the sensing means (29) and the centering means (28) are disposed in a first matching zone (25) of the mandrel (22) and the welding means (32, 33, 34) are disposed in a second welding zone (26)



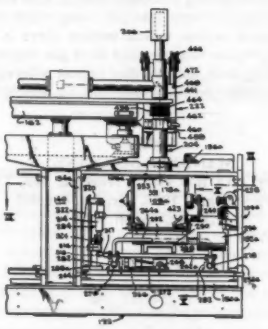
of the mandrel (22), said second zone being separated longitudinally from the matching zone (25), and said mandrel (22) further provided with means for longitudinal displacement of the mandrel (22) inside the lengths of tubing (3,4) by a step equal to the distance from the welding zone (26) to the matching zone (25).

4,493,967

RIGID SUPPORT FOR LASER MACHINING APPARATUS

Donald L. Wolfe, Allison Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,191
Int. Cl.^{3} B23K *27/00*
U.S. Cl. 219—121 LC **18 Claims**



1. Apparatus for laser machining, comprising:

(a) rigid bed means resting on a support surface for defining a first substantially planar, reference surface;

(b) laser means for emitting a laser beam;

(c) means affixed to said reference surface for rigidly mounting said laser means with respect to said reference surface;

(d) a platform;

(e) work piece housing means affixed to said reference sur-

face for defining and disposing a second, substantially planar sealing surface with respect to said first reference surface;

(f) a machining chamber for receiving the work piece and having an upper opening defining a third, substantially planar peripheral surface, said machining chamber being disposed on said platform;

(g) adjustable means for positioning said platform and said machining chamber mounted thereon so that said third peripheral surface is disposed substantially parallel with respect to said second sealing surface and spaced therefrom a distance sufficiently small to ensure the integrity of the machining environment within said machining chamber; and

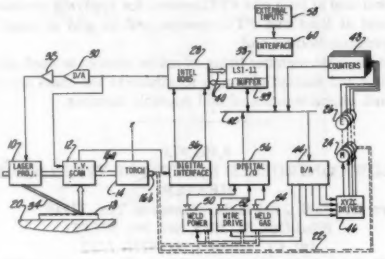
(h) fastening means for directly affixing said platform to said work piece housing means once said third peripheral surface has been so positioned with respect to said second sealing surface.

4,493,968

ADAPTIVE WELDER WITH LASER TV-SCANNER

Ronald D. Brown, Mapleton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 13, 1983, Ser. No. 513,533
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 **12 Claims**



1. In an adaptive welding apparatus:

means (10) for projecting a spot of monochromatic light onto a work surface defining a weld groove at an angle of incidence less than 90° and causing said spot to move repetitively along a spot scan path extending laterally across the weld groove and at a first repetition rate;

means (12) for repetitively scanning the spot scan path at a second repetition rate higher than the first rate to detect variations in reflected intensity of the spot along said scan path;

means (36) for producing a series of digital output signals in response to locations of peak intensity reflections in a three-axis position coordinate reference; and

processor means (28) for producing signals representing the weld groove profile along the spot scan path in response to receiving the digital output signals.

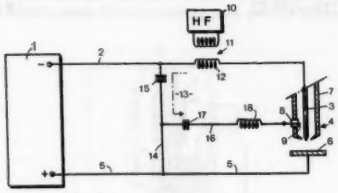
4,493,969

HIGH-FREQUENCY ARC STRIKING DEVICE AND AUXILIARY ELECTRODE OF AN ELECTRIC WELDING OR CUTTING ARC

Pierre Legrand, Pontoise, and Michel Arnout, Franconville, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 9, 1983, Ser. No. 550,242
Claims priority, application France, Nov. 12, 1982, 8219007
Int. Cl.³ B23K 9/06
U.S. Cl. 219—130.4 **11 Claims**

1. A device for striking an electric arc between a non-consumable main electrode and a workpiece to be welded or cut under a gaseous atmosphere which is conducted through a nozzle surrounding the main electrode, said device comprising said main electrode, said nozzle, an auxiliary electrode carried by said nozzle, a first arc striking circuit connecting said main electrode to said auxiliary electrode, a high frequency-high voltage generator connected to said arc striking circuit, a



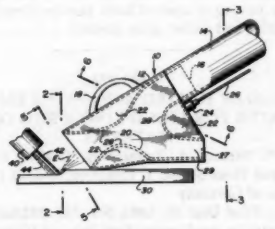
second arc striking circuit connecting one of said electrodes to said workpiece, said high frequency-high voltage generator being connected to said second arc striking circuit and said first arc striking circuit having dc blocking means and an HF impedance which is distinctly higher than the impedance of said second arc striking circuit.

4,493,970

SLAG AND FUME COLLECTOR FOR AIR CARBON-ARC CUTTING AND GOUGING TORCHES

Perry J. Rieppel, Worthington, and William J. Coughlin, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio

Filed Jan. 17, 1983, Ser. No. 458,600
Int. Cl.³ B23K 9/32
U.S. Cl. 219—137.41 **6 Claims**



6. A method for collecting heated solid or molten metal and/or slag generated by the air carbon-arc cutting and gouging process comprising the steps of:

directing said hot or molten metal and/or slag at a refrigerated surface containing a layer of ice in the absence of hot or molten metal striking said surface;

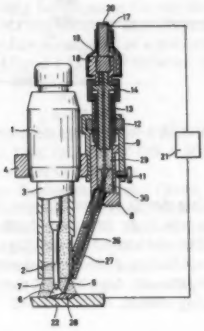
maintaining said refrigerated surface to continuously replace the layer of ice so that as the heated or molten metal and/or slag strikes the surface steam is liberated from the surface;

utilizing said liberated steam to cool and form discrete particles of said metal and/or slag by cooling and subdividing the metal and/or slag into granular form.

4,493,971
HOT WIRE TYPE ELECTRIC ARC WELDING TORCH

Akiyoshi Nawa, and Takso Shimizu, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,178
Claims priority, application Japan, Jan. 8, 1982, 57-1111[U]
Int. Cl.³ B23K 9/00
U.S. Cl. 219—137.52 8 Claims



1. A hot wire type electric arc welding apparatus, comprising:

a non-consumable electrode;

a shielding-gas nozzle surrounding said non-consumable electrode, said shielding-gas nozzle discharging a shielding gas around said electrode;

a welding torch containing said non-consumable electrode and said shielding-gas nozzle;

a wire feeding unit located substantially parallel to said welding torch for feeding a wire through a first guide bore therein;

means for heating and melting said wire;

a first guide connected to said wire feeding unit, said first guide being inclined toward said welding torch, said first guide having an insulated portion for feeding said wire to said workpiece;

an insulative spacer for guiding said wire from said wire feeding unit to said first guide, said insulative spacer having a second guide bore which forms an angle with said first guide bore for bending said wire, said insulative spacer having a tapered bore portion formed at each of wire inlet and outlet sides thereof.

4,493,972
ELECTRICALLY HEATED APPARATUS EMPLOYING A PTC HEATER FOR LIQUIFYING A ROD OF BINDING MATERIAL

Heinrich W. Steinel, 4, Tannenweg, D-4840 Rheda-Wiedenbrueck, and Hans Siwon, 1, Erlenweg, D-8201 Obing, both of Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,459
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049343; Apr. 14, 1981, 3115047
Int. Cl.³ H05B 1/02, 3/02; B67D 5/62; H01C 7/02
U.S. Cl. 219—230 14 Claims

1. Apparatus for liquifying a rod of binding material by application of heat, comprising:

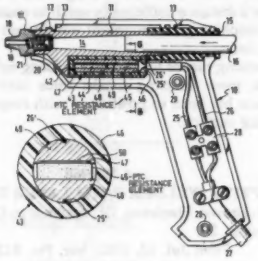
a heating member having a first channel and a second channel; said first channel extending in a predetermined direction from an inlet adapted to receive a rod of liquifiable binding material to an outlet for discharging liquified material from the rod, said second channel extending in said predetermined direction;

electrical heating means disposed within said second channel for creating in said first channel a temperature at least equal to the temperature required to liquify the rod, said electrical heating means comprising an elongated cartridge enclosing a positive temperature coefficient resistance means extending in said predetermined direction;

said positive temperature coefficient resistance means includes at least one PTC resistor;

said cartridge includes an electrically insulated and elastic housing for receiving said at least one PTC resistor;

at least two pressure bodies disposed within said housing on opposite sides of said at least one PTC resistor;



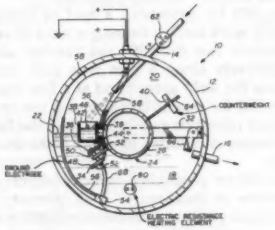
spring means disposed between one of said pressure bodies and said at least one PTC resistor for applying pressure to said at least one PTC resistor and to said at least two pressure bodies; and

said heatable member being of a size relative to each of said first and second channels to minimize the mass and heat sink characteristics of said heatable member.

4,493,973
FLOW CONTROLLED ELECTRODE TYPE LIQUID HEATER

Andrew H. Muhl, 2109 Huldy, Houston, Tex. 77019

Filed Oct. 31, 1983, Ser. No. 547,022
Int. Cl.³ H05B 3/60; F22B 1/30
U.S. Cl. 219—286 11 Claims



1. An electrode type liquid heater comprising:

a tank including an inlet and an outlet disposed so that in ordinary operation of the heater said tank is partially filled with electrically conductive tank liquid and there is an airspace filled with a body of electrically nonconductive gas above said tank liquid:

a movable heating assembly within said tank;

a plurality of spaced electrodes within said tank, at least one of which is carried by said heating assembly:

means for applying a voltage differential across said plurality of spaced electrodes;

said movable heating assembly including a surface for developing, in response to discharge of inlet liquid from said inlet onto said surface, an immersing force for causing said movable heating assembly to move from a normal position, in which said at least one electrode carried thereby is out of the tank liquid, to an immersed position, in which

said at least one electrode carried thereby is at least partially immersed in the tank liquid;

said movable heating assembly including means for causing said heating assembly to be returned to and maintained in said normal position upon termination of the discharge of the inlet liquid onto said surface; and

said surface being positioned at least partially in the airspace and said inlet being positioned to discharge inlet liquid onto said surface.

4,493,974

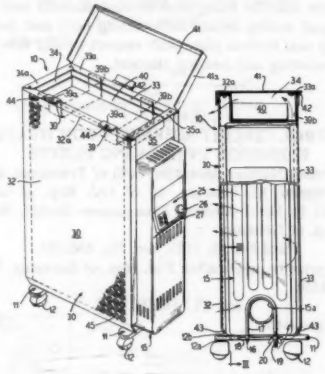
SNAP-FIT SHEET METAL COVER FOR PORTABLE OIL-FILLED RADIATORS AND METHOD OF MANUFACTURE

Jerome S. Ganek, Downers Grove, and Lee G. Ganek, St. Charles, both of Ill., assignors to Ciracco Metal Fabricating Co., Inc., Countryside, Ill.

Filed Jan. 12, 1983, Ser. No. 457,021

Int. Cl.³ F24H *7/02, 9/02*

U.S. Cl. 219—341 **13 Claims**



1. In combination, an oil filled electric radiator supporting structure having a supporting frame structure including castors supporting the same, an oil filled electric radiator mounted in supported assembly on the frame structure, means securing the radiator to said frame structrue, a radiator control panel at one end of said radiator, and a radiator cover structure mounted on the radiator and fitted about said control panel, the cover structure having a cover comprised of cold rolled steel having a thickness in the range of 0.033"–0.038", the cover including downwardly extending parallel sides on opposite sides of the radiator for permitting air flow to circulate to and from the radiator, one of said sides being perforated, the sides having yieldable confronting converging bottom ends extended beneath said radiator on its opposite sides, the bottom ends being spaced apart a distance narrower than the width of the radiator so as to yieldably engage against the sides of the radiator for holding the cover and its sides in snug assembly with the radiator and its frame structure and with said bottom ends of the sides also bodily engaged against said frame structure to support the cover on said frame structure.

4,493,975

HANG-UP HAIR DRYER

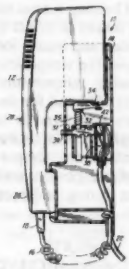
Katsumi Yamamoto, Chiba, Japan, assignor to Yamada Electric Industries Co., Ltd., Chiba, Japan

Filed Sep. 30, 1982, Ser. No. 430,731

Int. Cl.³ H01H *3/16;* H02H *3/00;* H05B *1/00*

U.S. Cl. 219—370 **18 Claims**

1. An electric appliance system comprising an appliance adapted to be held in an operator's hand, a support housing means adapted to receive said appliance, a power input extending from said support having means for receiving electric energy from a voltage source, a two-pole switch means housed in said support housing means and connected to said power input for enabling application of said electric energy to said appliance, a power cord extending between said switch means and appliance for applying electric energy to said appliance, and a manually operable control means operatively coupled to said switch means for controlling said switch means, wherein



said power cord is connected and disconnected from said power input when said switch means is in the ON and OFF positions, respectively, said appliance including terminals connected across said voltage source and bearing load current when said two-pole switch means is in a closed ON position, said terminals each being electrically isolated from said voltage source when said two-pole switch means is in the open OFF position.

4,493,976

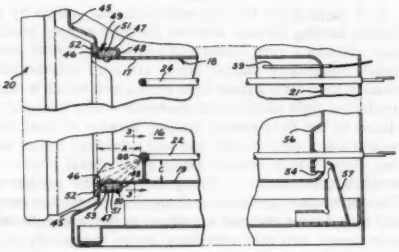
PYROLYTIC OVEN CLEANING SYSTEM

Arthur C. Wilson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 2, 1983, Ser. No. 490,326

Int. Cl.³ F24C *15/32;* A21B *1/22;* F27D *11/02*

U.S. Cl. 219—398 **4 Claims**



1. A heating-cleaning oven in which food is cooked during a cooking operation and the food by-products to be removed are pyrolytically decomposed during a high temperature cleaning operation, comprising:

a housing defining an oven cavity having vertical side walls, top, bottom and vertical rear walls, and an open front opening for access to the cavity of the oven, a door pivotally connected adjacent a lower portion of said oven cavity for movement between a generally vertical closed position and a generally horizontal open position;

a first heating means arranged adjacent the top wall of said cavity and a second heating means arranged adjacent the bottom wall of said oven for establishing said cooking operation, as well as said second heating means including a front portion arranged in spaced relationship in an area of said bottom wall adjacent said front opening, said front

portion being arranged a distance from said area effective to maintain said area at a temperature sufficient to pyrolytically decompose said food by-products from said area during said high temperature heat cleaning operation;

an oven temperature control means including means operable at cooking temperature ranges for controlling energization of said heating means during cooking operation of said oven and means operable at high test cleaning temperature range for controlling energization of said heating means during heat cleaning operations;

control means for said heating means selectively operable to control the heating means to effect the high temperature heat cleaning operation and means for energizing said first heating means to raise the temperature of said oven interior to a heat-cleaning temperature range of between about 750° and about 950° and for de-energizing said first heating means when said oven is in said heat-cleaning range and for energizing said second heating means to insure that said heat-cleaning temperature range is maintained in said area of said bottom wall adjacent said front opening of said oven during said heat cleaning operation.

4,493,977

METHOD FOR HEATING SEMICONDUCTOR WAFERS BY A LIGHT-RADIANT HEATING FURNACE

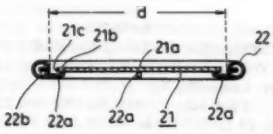
Tetsuji Arai, Kobe; Yoshiki Mimura, and Hiroshi Shimizu, both of Yokohama, all of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,014

Claims priority, application Japan, Sep. 30, 1982, 57-169889

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—411 **5 Claims**



1. A method for heating semiconductor wafers by a light-radiant heating furnace wherein the light-radiant heating furnace includes a main heater and a subsidiary heater, said main heater comprising tubular lamps arranged substantially in a plane so as to form a plane light source unit which is capable of irradiating light onto a semiconductor wafer transported and placed in the light-radiant heating furance to heat mainly a central major part thereof, and said subsidiary heater having a ring shape which extends along a peripheral portion of the semiconductor wafer to heat principally the peripheral portion, the method comprising determining actuation curves for said main heater and said subsidiary heater, and actuating said main heater and said subsidiary heater repeatedly in accordance with their respective actuation curves in synchronization with intermittent transportation of the semiconductor wafers into said light-radiant heating furnace.

4,493,978

SERVING DISH WITH HEATING MEANS

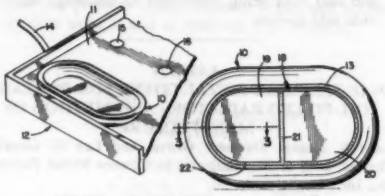
Roger A. Starnes, 10230 Belladrum Dr., Alpharetta, Ga. 30201

Filed Jul. 11, 1983, Ser. No. 512,550

Int. Cl.³ F27D *11/02*

U.S. Cl. 219—438 **3 Claims**

1. A serving dish with heating means, said serving dish including a ceramic dish having a bottom, and a ridge surrounding said bottom, an electric heating element comprising an electric resistance element, electrically insulative material substantially covering said electric resistance element, said electrically insulative material defining holes therein for positioning electrical contact points for said electric resistance element, said electric heating element being disposed substantially against said bottom of said ceramic dish and generally coextensive therewith, a bottom plate substantially covering said heating element, said bottom plate comprising a pair of electrically conductive half-plates, said pair of half-plates being electrically separated from each other, each half-plate of said



pair of half-plates being electrically connected to one contact point of said electrical contact points for said electric resistance element, adhesive means fixing said heating element to said bottom and for fixing said bottom plate to said heating element, and sealing means surrounding both said half-plates for sealing said bottom plate with respect to said serving dish for encapsulating said heating element.

4,493,979

CONTROL CIRCUIT ASSEMBLY FOR HEATING ELEMENTS IN COOKING PLATES

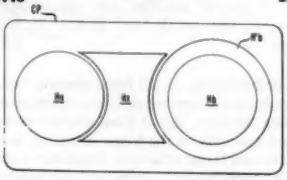
Walter Bredel; Norbert Schenetin, both of Traunreut, and Helmut Walgand, St. Georgen, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeraete GmbH, Stuttgart, Fed. Rep. of Germany

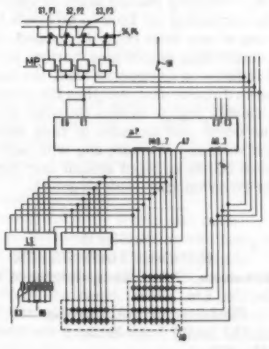
Filed Feb. 9, 1983, Ser. No. 465,055

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204598

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—446 **12 Claims**





1. Control circuit assembly, comprising a cooking plate having at least two individual cooking regions being electrically connectible in common for cooking together, heating

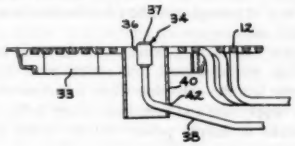
elements being disposed in said cooking regions of said cooking plate and having inputs, current circuits connected to said heating elements, an electronic control device connected to said inputs of said heating elements for producing variable heating power outputs, heating power control devices respectively associated with said heating elements, and switching elements disposed in said current circuits for selectively connecting each of said respective heating elements in said individual cooking regions to one of said heating power control devices in a first switching mode, and for connecting said heating elements of said individual cooking regions together to one of said heating power control devices while disconnecting the other heating power control devices for said respective heating elements with which they are associated in a second switching mode.

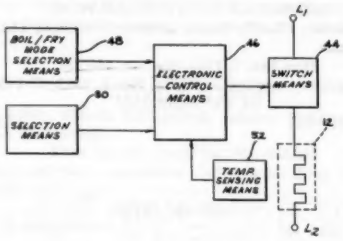
4,493,980

POWER CONTROL ARRANGEMENT FOR AUTOMATIC SURFACE UNIT

Thomas R. Payne, and David A. Schneider, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 5, 1984, Ser. No. 586,052
Int. Cl.³ H05B 1/02
U.S. Cl. 219—450 **14 Claims**





1. A surface unit power control arrangement for a cooking appliance comprising:

at least one surface unit for supporting and heating a cooking utensil placed thereon and adapted for energization by an external power supply;

temperature sensing means for sensing the temperature of a utensil supported on said surface unit;

user operable input selector means enabling a user to select a Fry mode, and to select for said mode one of a plurality of different heat settings; each heat setting having associated with it a predetermined steady state surface unit power level and a predetermined steady state temperature range;

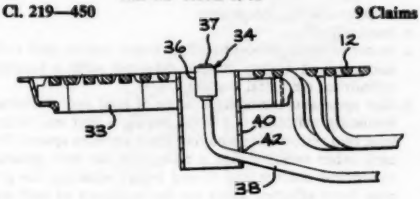
electronic control means responsive to said temperature sensing means and said input means for controlling energization of said surface unit in accordance with the sensed utensil temperature and selected heat setting, said control means being operative in said Fry mode to generate an error signal which is a function of the difference between said sensed temperature and said steady state temperature range, and wherein said control means operates said surface unit at an applied power level which exceeds the steady state power level for the selected heat setting by a number of power levels determined as a function of said error signal, the applied power level approaching said steady state power level for the selected heat setting as said error signal approaches zero, whereby the utensil is rapidly brought to the selected temperature range with minimal overshoot.

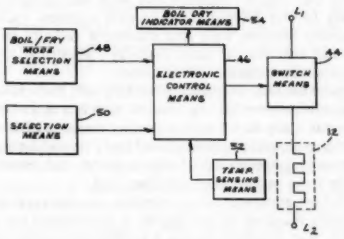
4,493,981

BOIL DRY PROTECTION SYSTEM FOR COOKING APPLIANCE

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 5, 1984, Ser. No. 586,351
Int. Cl.³ H05B 1/02
U.S. Cl. 219—450 **9 Claims**





1. A boil dry detection arrangement for a cooking appliance having at least one surface unit for supporting a cooking utensil thereon while heating the contents thereof, said arrangement comprising:

control means for controlling the energization of the surface unit by an external power supply;

temperature sensing means for sensing the temperature of the utensil supported on the surface unit;

indicator means responsive to said control means for generating a user discernible signal indicative of a boil dry condition;

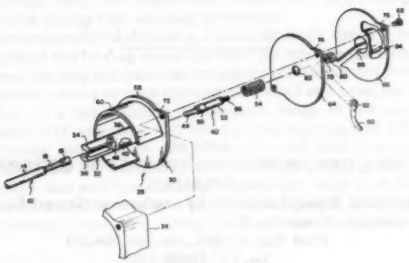
said control means including means responsive to said temperature sensing means for determining the rate of change of the sensed utensil temperature and detecting a rate of change greater than a predetermined reference rate, said reference rate characterizing a boil dry condition;

said control aeans being operative upon detection of a rate of increase greater than said reference rate to de-energize the surface unit and to trigger said indicator means to generate said user discernible signal.

4,493,982
HOLDER APPARATUS FOR HEATER ELEMENT

John A. Romansky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1983, Ser. No. 534,522
Int. Cl.³ F24H 3/00
U.S. Cl. 219—469 3 Claims



1. A fuser station comprising:

a fuser roller;

a heater element concentrically located within said roller, said element having at least one end with a generally cylindrical electrical contact;

holder apparatus including a body of heat and electrically insulating material, said body having a first end with at least two resilient arms having inner surfaces spaced from each other which define a receptacle for said generally cylindrical contact end of said heater element, the gripping force effected solely by the resiliency of said arms gripping the contact end of said element to provide the sole support for said heater element during insertion and removal of said heater element relative to said fuser roller; said body having a second end integral with said first end, said second end having a recess which is axially aligned with and which communicates with said receptacle; said body further having a cup-shaped segment including a member integral with and extending radially from said second end and at least partially cylindrical mounting member concentric with said end;

a support member rotatably mounting said fuser roller, said support member having a recess which is dimensioned to provide a slip fit for said mounting member of said body, said cup-shaped segment of said body providing a grip for manually gripping said body to insert and remove said body from said support member; and

said holder apparatus also including an electrical terminal slidably mounted in said recess in said second end of said body, said terminal having a portion extending into said receptacle and engaging the electrical contact of said heater element.

4,493,983
CURRENT DETECTOR IN COMBINATION WITH AN ELECTRICAL APPARATUS

Russell H. Taggert, 23 Orpinent Ave., Dersley Park, Springs, Transvaal, South Africa

Continuation of Ser. No. 229,631, Jan. 29, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 486,665
Claims priority, application South Africa, Feb. 1, 1980, 80/0596; Oct. 21, 1980, 80/6444
Int. Cl.³ H05B 1/02
U.S. Cl. 219—494 12 Claims

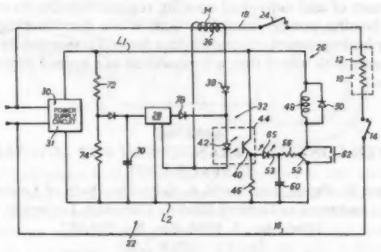
1. A device for incorporation into the power supply circuit of an electrical apparatus comprising:

a power supply line forming part of said circuit,

a first switch which is in the power supply line and which may be open or closed depending upon extraneous conditions,

a second switch which is in the power supply line in series with the said first switch and which is movable from an open first condition to a second closed condition on application of power to switch moving means therein and being held in said second condition as long as power is applied to the switch moving means,

a signal emitter adapted to emit a power signal of short duration and being connected to the switch moving means so that on emission of the said power signal the switch will



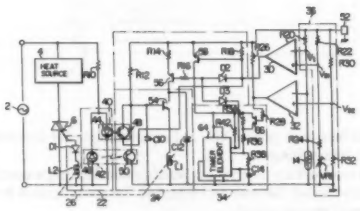
be moved to said second condition for the duration of the power signal, and

current detector means comprising a coil that is in electromagnetic but not electrical connection with the said power supply line for detecting when a current flows in said power supply line and being connected to the switch moving means to supply power thereto when current flows in the line.

4,493,984
TEMPERATURE CONTROL DEVICE FOR FIXING HEAT SOURCE OF COPYING MACHINE

Koji Yamauchi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,209
Claims priority, application Japan, Feb. 8, 1982, 57-17507
Int. Cl.³ H05B 1/02
U.S. Cl. 219—501 2 Claims



1. A temperature control device for a fixing heat source of a copy machine including:

an a.c. power source;

a heat source generating heat by being energized by power supplied from said a.c. power source thereby fixing an image transferred onto a copying sheet;

at least one temperature sensor for sensing the temperature of said heat source to provide a temperature-indicative signal; and

control means for controlling the power supplied from said a.c. power source to said heat source in response to the temperature-indicative signal applied from said temperature sensor,

said control means comprising:

a trigger pulse generating circuit detecting the zero-cross

point of the a.c. waveform supplied from said a.c. power source thereby generating a trigger pulse signal in synchronism with the zero-cross point;

a power supply circut permitting supply of the power from said a.c. power source to said heat source in response to said trigger pulse signal; and

a control signal generating circuit generating a control signal for controlling said trigger pulse generating circuit, said control signal generating circuit being composed of a first reference setting means for setting a first reference voltage according to a first predetermined temperature lower than a fixing temperature, a second reference setting means for setting a second reference voltage according to a second predetermined temperature corresponding to the fixing temperature, a first comparator for comparing said temperature-indicative signal provided from the temperature sensor with the first reference voltage provided from the first reference setting means, a second comparator for comparing said temperature-indicative signal provided from the temperature sensor with the second reference voltage provided from the second reference setting means, an ON-OFF signal generating circuit controlled at an actuating condition by the output signal of the first comparator, for controlling an ON-OFF duty factor by the output of the second comparator, and a signal processor for controlling said trigger pulse generating circuit by receiving the output of the first comparator and the output signal of the ON-OFF signal generating circuit, whereby said power supply circuit supplies a full-wave current from said a.c. power source to the heat source until the temperature sensor detects said first predetermined temperature, and a half-wave current from said a.c. power source to the heat source until said temperature sensor detects said second predetermined temperature after said first predetermined temperature has been detected, and then after the second predetermined temperature has been detected by the temperature sensor, the duty factor of the half-wave current is reduced to maintain the temperature of the heat source at a constant value.

4,493,985

WELDING SLEEVE

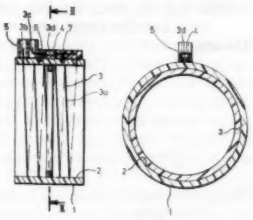
Hans Keller, Richen, Switzerland, assignor to Geberit A.G., Jona, Switzerland

Filed Apr. 27, 1983, Ser. No. 489,253

Claims priority, application Switzerland, May 12, 1982, 2948/82

Int. Cl.³ H05B 3/58

U.S. Cl. 219—535 **11 Claims**



1. A welding sleeve for connecting pipes formed of thermoplastic material comprising an axially extending sleeve member having an inner surface and an outer surface with the inner surface arranged to contact the pipes to be connected, an electrical conductor is located in said sleeve member in the form of a resistance heating wire having a pair of opposite ends, said opposite ends arranged for conveying current through said heating wire, said resistance heating wire is arranged in said sleeve member for heating the inner surface of said sleeve for transmitting the heat to the pipes to be connected, characterized in that said resistance heating wire includes a predetermined melting material located between the opposite ends of said resistance heating wire so that said material melts through approximately when the heat energy required for welding said sleeve to the pipes to be connected has been developed and causes the termination of the flow of current through said electrical conductor and thereby the discontinuance of heating said sleeve by said resistance heating wire.

4,493,986

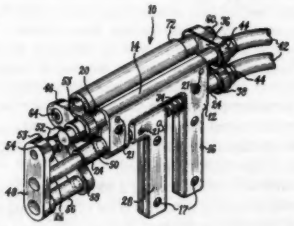
PISTOL GRIP ELECTRICAL BRAZING TOOL

Daniel L. Carter, Armuchee, and Homer H. Hall, Rome, both of Ga., assignors to General Electric Company, King of Prussia, Pa.

Filed Jun. 28, 1983, Ser. No. 508,756

Int. Cl.³ B23K 1/04

U.S. Cl. 219—85 D **8 Claims**



1. A pistol grip electrical brazing tool comprising, in combination:

an L-shaped member formed of structurally rigid insulating material having a depending handle portion and an elongated, longitudinally extending barrel portion, said barrel portion having an upper longitudinal passageway therethrough and a pair of longitudinally aligned lower passageways separated by a recessed section of said barrel portion;

an elongated upper support element accommodated in said upper passageway;

an elongated lower support element accommodated in said aligned second passageways, said lower support element being exposed at said recessed section of said barrel portion;

a trigger formed of structurally rigid insulating material affixed to the exposed portion of said lower portion element for disposal in parallel relation to said handle portion;

a spring acting between said handle portion and said trigger to bias said handle portion and trigger apart;

separate electrically conductive, laterally extending first links affixed to the rearward ends of said upper and lower support elements;

separate electrically conductive, laterally extending second links affixed to the forward ends of said upper and lower support elements;

electrodes removably affixed to said second links in longitudinally opposed relation;

brazing cable connectors affixed to said first links;

separate heavy current carrying conductors electrically connected between lateral extensions of said first and second links for shunting brazing currents between said electrodes and said cable connectors from said upper and lower support elements; and

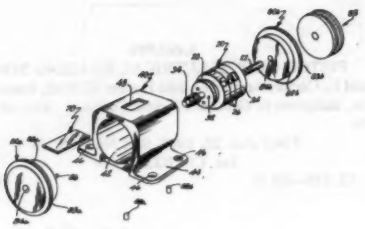
means affixing one of said support elements to said barrel portion such that squeezing said handle portion and trigger together against the bias of said spring reciprocates the other of said support elements to bring said electrodes into opposed engaging relation with a workpiece to be brazed.

4,493,987

COUNTER

James A. Kammeraad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.

Filed Jan. 31, 1983, Ser. No. 462,612
Int. Cl.³ G06C 5/02
U.S. Cl. 235—1 D 1 Claim



1. A counter comprising:

a counter barrel having a shaft, a plurality of display rings having digits contained thereon, and an index drum having an aperture on its face;

an extruded housing having a base and an upper surface, said housing having a central bore therethrough within which said barrel is positioned and an affixation plate extending from either side of the base thereof for affixing said counter in its working environment;

a drain hole through said base of said housing, said hole being in communication at one end with the central bore and at the other end with the outside environment;

a window in said upper surface of said housing, said window being rectangular in shape and having a length and width substantially smaller than the length and width of said upper surface, the size of said window being dimensioned so as to display therethrough a single row of digits on said display rings;

a frusto-triangular cutout in communication with said central bore and located below said upper surface of said housing, said cutout having a length coextensive with the length of said upper surface, the apices thereof defining a pair of slots, the longitudinal axis of each of said slots being parallel to the longitudinal axis of said upper surface, whereby said slots provide a flat rectangular area below said upper surface and the window located therein;

a transparent pane having a length and width substantially the same as the length and width of said rectangular area defined by said cutout, said pane being inserted into and supported by said slot, said pane thereby being positioned directly below said upper surface of said housing;

a pair of end caps, each of said caps having an interior tubular section matching generally in configuration the configuration of said central bore, said tubular sections being telescopically inserted into said bore during assembly of said counter; an exterior flange section overlying the extremities of said housing when said counter is assembled with said interior tubular sections resting within the extremities of said bore; and means thereon for receiving and supporting opposite ends of the shaft; and

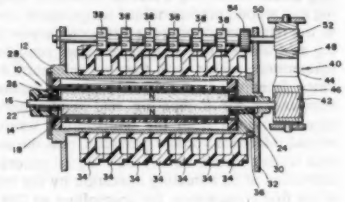
a stop pin integrally formed to the inner face of one of said end caps and extending perpendicularly therefrom, said stop pin being inserted into said aperture in said face of said index drum, whereby said stop pin, upon being inserted into said aperture, prevents said counter barrel from rotating as said display rings are rotated.

4,493,988

ODOMETER USING AN ELECTRIC MOTOR DISPOSED WITHIN ANNULAR FIGURE WHEELS

Etsuo Ichimura, Omiya, Japan, assignor to Kanto Seiki Co., Limited, Omiya, Japan

Filed Jun. 22, 1981, Ser. No. 275,713
Claims priority, application Japan, Jul. 11, 1980, 55-97936[U]; Feb. 16, 1981, 56-20297[U]; Apr. 3, 1981, 56-48178[U]
Int. Cl.³ G01C 22/02
U.S. Cl. 235—96 9 Claims



1. In an odometer for a vehicle:

a first essentially cylindrical hollow housing;

a rotor having a shaft, said rotor being rotatably disposed within said hollow housing and forming part of an electric motor;

a plurality of rotatable annular figure wheels slidably disposed on the external periphery of said housing, said housing being arranged to pass through all of said figure wheels;

a gear train drivingly interconnecting said shaft and said plurality of figure wheels for rotating said figure wheels in response to the rotation of said rotor, said gear train including drive pinions which interconnect adjacent figure wheels, said drive pinions being located on the external periphery of said figure wheels; and

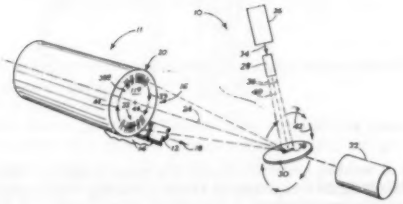
means for inducing said rotor to rotate in response to an electronic signal indicative of vehicle speed.

4,493,989

CONTAINER END-CODE REDEMPTION SCANNING

Alfred A. Hampson, 2687 SW. Buena Vista Pl., Portland, Oreg. 97201; Thomas B. Hutchins, deceased, late of Portland, Oreg., and by Nancy K. Hutchins, executrix, 310 NW. Brynwood La., Portland, Oreg. 97229

Filed Apr. 28, 1982, Ser. No. 372,735
Int. Cl.³ G06K 7/10
U.S. Cl. 235—464 12 Claims



1. Apparatus for enabling scanning of, for the purpose of recovering information from, an electromagnetic-wave-readable code patch on the lid of a carbonated beverage container, where such patch is formed of plural, spaced, linear code elements having a predetermined length, said apparatus comprising

means defining a scanning zone adapted to receive such a container with the lid thereof exposed for viewing,

means disposed adjacent said scanning zone for producing a defined beam of electromagnetic radiation, and

beam-impingement sweep-effecting means operatively interposed between said beam-producing means and any can in said zone for effecting impingement of the beam with the lid of such can, and relative rotary movement therebetween to cause the region of beam/lid impingement to sweep relatively and generally centrally over the elements in such a patch,

the region of beam/lid impingement being elongated and linear in form with a length less than the predetermined length of the code elements, and moving relative to a lid viewable in said zone in such a manner that, while sweeping over a code element, the region's long axis substantially parallels the long axis of the element.

4,493,990

APPARATUS FOR AUTOMATICALLY ADJUSTING A DEFLECTION UNIT

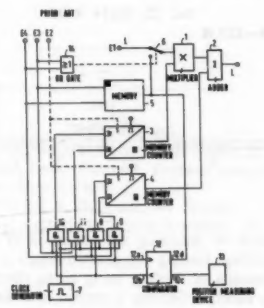
Gunther Koszytorz, Penzberg; Herbert Lucke, Erlangen; Gerhard Schlosser, Weiher, and Joachim Vath, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,909

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142152

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **9 Claims**



1. An apparatus for automatically adjusting the characteristic of a deflection unit with respect to its origin and slope, the apparatus comprising:

multiplier means having a first input for receiving a reference value for the deflection unit, said multiplier means further having a second input and an output;

first memory means for storing information pertaining to a first value, said first memory means having an output connected to said second input of said multiplier means;

adder means having first and second inputs and an output for providing a signal responsive to the sum of signals at said first and second inputs, said output of said multiplier means being connected to said first input of said adder means;

second memory means for storing information pertaining to a second value, said second memory means having an output connected to said second input of said adder means;

position measuring means for producing a position measuring signal responsive to the position of the deflection unit;

first command receiving means for receiving a "zero-adjustment command;"

second command receiving means for receiving a "slope-adjustment command;"

clock means for producing signals for selectably incrementing and decrementing said first and second values in said first and second memory means;

comparator means having first and second inputs and first and second outputs for producing respective signals at said first and second outputs responsive to comparisons of signals at said first and second inputs, said position measuring means being connected to said first input of said comparator means, said second input of said comparator means receiving a signal corresponding to a zero value as a first adjustment reference value whena "zero-adjustment command" is present at said first command receiving means, and for receiving a second adjustment reference value when a "slope-adjustment command" is present at said second command receiving means, said comparator means producing at said second output said respective signal when said signal at said first input from said position measuring means is smaller than said respective signal at said second input;

means responsive to said "zero-adjustment command" for causing said first adjustment reference value having a value of zero to be provided as said reference value for the deflection unit, causing said second value in said second memory means to be incremented in response to said clock means when said respective signal is present at said first output of said comparator means, and further causing said second value in said second memory means to be decremented in response to said clock means when said respective signal is present at said second output of said comparator means until said first and second outputs of said comparator means are clear of said respective signals; and

means responsive to said "slope-adjustment command" for causing said second adjustment reference value to be provided as said reference value for the deflection unit, causing said first value in said first memory means to be incremented in response to said clock means when said respective signal is present at said first output of said comparator means, and further causing said first value in said first memory means to be decremented in response to said clock means when said respective signal is present at said second output of said comparator means until said first and second outputs of said comparator means are clear of said respective signals.

4,493,991

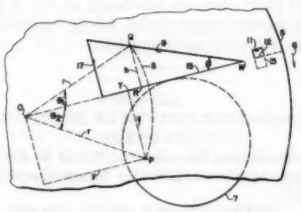
TECHNIQUES FOR LOCATING BEAMS WITHIN LARGE AREA DETECTORS

John G. Gualtieri, Oceanport, and John R. Vig, Colts Neck, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,232

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—203 R **4 Claims**



1. A method of determining the point of impingement of a narrow beam on a detector having an area that is large relative to the beam, comprising the steps of: passing said beam through a planar chopper located between the beam source and said detector, said planar chopper rotating at a constant angular velocity around an axis normal to the plane of said detector and offset at a fixed position from the field of view of said detector, said chopper having a triangular aperture therein with the leading edge thereof including a triangle leg which

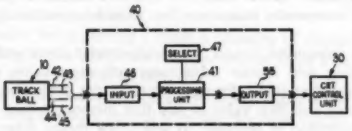
extends along a radius of said chopper for a length that is longer than the widest dimension of said detector, said aperture being located such that it sweeps over the entire field of view of said detector once during each revolution of said chopper, measuring the time duration of signal output from said detector passing through said aperture for each revolution of said chopper and determining from this duration and the geometry of said chopper aperture and said detector the radial distance of said point of impingement from the axis of rotation of said chopper, measuring the elapsed time with no signal output from the start of the scanning of said field of view by said triangular aperture to the start of the detected signal in the output of said detector, and determining from said elapsed time the angular position of said point of impingement relative to said chopper and aperture geometry.

4,493,992

ADAPTER CIRCUIT FOR TRACKBALL DEVICE

David A. Geller, Chicago, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Aug. 23, 1982, Ser. No. 410,261
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—221 **29 Claims**



3. An adapter for converting the output signals from a trackball-type position control device to a form compatible with an input port designed to receive the output of a joystick-type position control device, the trackball device output signals comprising four pulse trains, with a set of two pulse trains for each of two components of rotation of the trackball respectively about orthogonal axes, wherein for each set of pulse trains the pulse repetition rate is related to the speed of rotation of the trackball about the corresponding axis and the phase relationship of the two pulse trains is related to the direction of rotation of the trackball about the corresponding axis, said adapter comprising: input means for receiving the output signals of the trackball device; and processor means operating under stored program control and connected to said input means and having two n-bit parallel output ports respectively corresponding to 2 orthogonal axes, where n is an integer greater than one, said processor means being responsive to each set of pulse trains for producing at one of said output ports n-bit parallel coded digital signals representative of a position along the corresponding axis.

4,493,993

APPARATUS FOR OPTICALLY DETECTING INK DROPLETS

Franz X. Kunamuller, Glenside, and Edwin R. Phillips, Rosemont, both of Pa., assignors to Sperry Corporation, New York, N.Y.

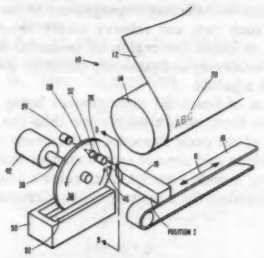
Filed Nov. 22, 1982, Ser. No. 443,405
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—222.1 **13 Claims**

1. An apparatus for optically detecting ink droplets comprising:

light emitting means operably connected to said apparatus for emitting a light signal;

light receiving means operably connected to said apparatus receiving said light signal;

light relaying means operable for relaying said light signal from said emitting to said receiving means, said relaying means movable from a first position wherein ink is deposited thereon to a second position wherein said deposited ink interrupts relay of said light signal.

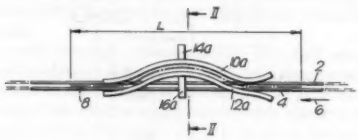


4,493,994

DETECTING THE CONDITION OF A SHEET

Graham H. Hilton, Lovedean, England, assignor to De La Rue Systems Limited, London, England

Filed Oct. 27, 1982, Ser. No. 436,920
Claims priority, application United Kingdom, Oct. 27, 1981, 8132363
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—223 R **5 Claims**



1. A method of detecting the condition of a rectangular sheet, comprising: feeding the sheet through a checking station, the direction of feeding being along the length or the width of the sheet; deflecting a portion of a side edge of the sheet at the checking station relatively to the remainder of a zone of the sheet lying adjacent to a line through the checking station transverse to the direction of feeding, the direction of deflection of the deflected portion being orthogonal to the line and to the direction of feeding, so that the deflected portion is stretched along the direction of feeding; and subjecting the deflected portion to a beam of radiation directed towards sensing means and intercepted by the deflected portion, whereby any substantial tear from the side edge into the deflected portion will be opened, and will be revealed by the sensing means receiving radiation through the opened tear.

4,493,995

FIBER OPTICAL MEASURING DEVICE WITH A FREQUENCY SENSITIVE TRANSDUCER

Morgan Adolfsson; Torgny Brogardh; Christer Ovren, and Anders Persson, all of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

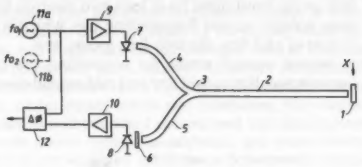
Filed May 7, 1982, Ser. No. 376,142
Claims priority, application Sweden, May 8, 1981, 8102889
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **25 Claims**

1. A fiber optical measuring device for measuring a physical quantity comprising:

a measuring transducer comprising a sensor material having at least one optical property dependent on the modulating frequency of light supplied thereto;

an electronic unit; and

light-conducting fiber means connecting the measuring transducer to the electronic unit;
the electronic unit including
light source means for transmitting excitation light via the fiber means to the sensor material;
modulating means arranged so that said excitation light is modulated at at least one modulating frequency within a



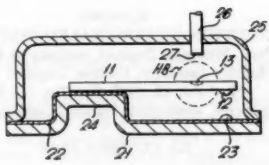
frequency range in which said optical property of the sensor material is influenced by the physical quantity to be measured, the light emanating from the sensor having at least one component dependent upon the physical quantity to be measured; and
means for detecting said component of the modulated light emanating from the sensor material in response to excitation light at said one modulating frequency.

4,493,996

SEMICONDUCTOR SWITCH DEVICE

Henley F. Sterling, Great Dunmow, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,341
Claims priority, application United Kingdom, Jul. 2, 1981, 8120464
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 **5 Claims**



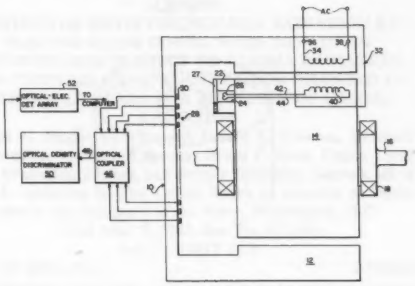
1. An opto-electrical contact unit, comprising:
a movable member carrying one or more contacts;
at least one contact disposed in registration with the contacts on the movable member;
a pn junction formed on said movable member;
a short circuit current loop connected across said pn junction;
means for providing a magnetic field in the region of said junction; and
means for subjecting said junction to electromagnetic radiation, whereby said electromagnetic radiation causes the junction to induce a current circulating through said short circuit loop, said current forming a magnetic field which interacts with the firstmentioned magnetic field to cause the movable member to bend so that an electrical contact may be made between the contacts that are in registration with each other.

4,493,997

FIBER OPTIC SENSOR FOR SHAFT STATE

Arnold Schindel, Fairlawn, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Sep. 1, 1982, Ser. No. 413,922
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE **2 Claims**



1. An optical shaft state sensor comprising:
an input shaft;
a rotating member connected to the input shaft;
a stationary member located adjacent the rotating member;
a light source mounted to a surface of the rotating member at a distance R from the axis of the shaft;
at least one plurality of optic fibers arranged in a generally circular pattern on a stationary member surface confronting the rotating member surface to which the light source is mounted, each fiber located at a distance R from the axis of the shaft so that the light source is in selective optical alignment with the fibers as the shaft rotates;
means for discriminating which of the fibers is illuminated by the light source at any point in time;
means including an optical coupler and an optical cable bundle for optically coupling the optic fibers to the discriminating means;
a rotary transformer having a primary winding mounted to the stationary member and a secondary winding mounted to the rotating member;
means connecting the secondary winding to the light source;
AC input terminals connected to the primary winding for providing power for the light source;
detecting means including a detector array of a computer and located at a point remote from the discriminating means and having an optical input therefrom for converting data at the optical input to corresponding electrical data; and
slit means located adjacent the light source for producing a narrow light beam for impinging upon the optic fibers.

4,493,998

METHOD FOR MONITORING DRILLING MATERIALS FOR GAMMA RAY ACTIVITY

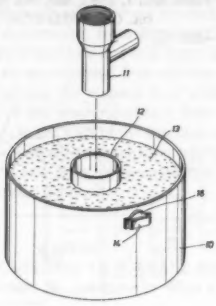
Harry D. Smith, Jr.; Dan M. Arnold, and Ward E. Schultz, all of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 2, 1982, Ser. No. 364,837
Int. Cl.³ G01V 5/00
U.S. Cl. 250—252.1 **10 Claims**

1. A method of quantitatively determining the amount of background gamma ray radioactivity which would be detected in a gamma ray sensitive logging tool in a wellbore due to the presence of naturally occurring radioactive materials in drilling fluid comprising the steps of:
(a) placing a sized sample of drilling fluid in a container;
(b) positioning a sensor means in said container at a position where said sensor means is exposed to gamma radiation

from said sample to form an output indicative of gamma ray radioactivity of said sample; and

(c) converting said sensor means output according to a predetermined functional relationship into an output value



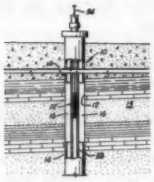
indicative of the gamma radiation background which the drilling fluid would induce in a gamma ray measuring logging device as a function of drilling fluid density and wellbore diameter.

4,493,999

METHOD OF ENERGY RESOLVED GAMMA-RAY LOGGING

Gary L. Catchen, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 10, 1981, Ser. No. 329,441
Int. Cl.³ G01V *5/00*; G21H *5/02*
U.S. Cl. 250—260 **3 Claims**



1. A radioactive logging method for evaluating a well bore and its surrounding formation in which gamma-ray-emitting elements may be naturally present, comprising the steps of,

injecting cobalt-58 into the formation; and

traversing the well bore with a gamma-ray-detection system which is tuned to detect gamma-ray-emission of the 811 keV energy level.

4,494,000

IMAGE DISTORTION-FREE, IMAGE ROTATION-FREE ELECTRON MICROSCOPE

Kazuo Shii, Ibaraki; Hiroyuki Kobayashi, Katsuta; Morioki Kubozoe, Katsuta, and Shigeto Isakozawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

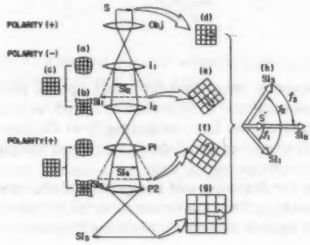
Filed Jun. 29, 1982, Ser. No. 393,332
Claims priority, application Japan, Jul. 1, 1981, 56-101195
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—311 **21 Claims**

1. An electron microscope, comprising:

means for emitting an electron beam along a beam axis and for irradiating a specimen on said beam axis with said electron beam so that said electron beam is transmitted through said specimen;

an electron lens system having means for magnifying said transmitted electron beam, said lens system being disposed along said beam axis and including a first electron lens, a first electron lens group constituted by at least two electron lenses of the same polarity which is opposite from the polarity of said first electron lens, and a second electron lens group constituted by at least two electron lenses of a same polarity as said first electron lens which is opposite to that of said first electron lens group; and

lens current control means for controlling the excitation currents supplied to said first and said second electron lens



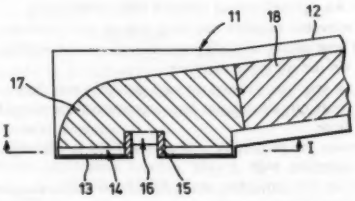
groups so that given lens members belonging to said first and second electron lens groups, respectively, serve as reduction lenses in a range of low magnifications, and the lenses of said first and second electron lens groups as a whole operate as a magnifying lens system in a range of high magnifications, said lens current control means including means for controlling said excitation currents in such a manner that the difference between the excitation currents supplied to said first and second electron lens group is maintained substantially constant when the magnification of the microscope is changed, whereby image and rotational distortions in the image produced by the electron beam transmitted through said specimen are compensated over a wide range of magnifications.

4,494,001

DETECTION OF CONCEALED MATERIALS

Peter F. Peck, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 15, 1980, Ser. No. 168,359
Claims priority, application United Kingdom, Jul. 30, 1979, 7926435
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—358.1 **2 Claims**



1. A device for searching for low atomic number materials especially organic materials concealed by metal such as steel up to 12 millimeters thick, said device comprising a cylindrical end housing with a cylindrical side arm attached thereto, which side arm provides a convenient handle for holding the device, an annular scintillation crystal disposed close to a side

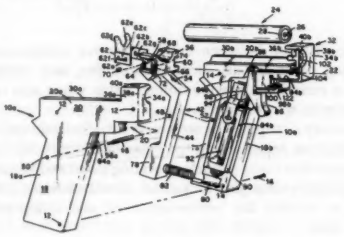
wall of the housing, a short cylindrical collimator disposed within the central circular aperture of the said scintillation crystal, a capsule containing a radioactive material source of γ radiation mounted in said collimator at the end thereof remote from said side wall, the capsule having a tungsten alloy backing which shields against radiation emanating from the source in the direction away from the said side wall, a photomultiplier, a light guide providing an optical path for directing the light from scintillations in the scintillation crystal onto said photomultiplier, first and second ratemeter to both of which is fed the backscatter count provided by the output of the photomultiplier, said ratemeters having different rates of response to change in count rate, and a detector means for subtracting the output of one ratemeter from the output of the other ratemeter such that, under steady count rate conditions, the outputs of the ratemeters will become balanced and the detector means will provide a zero indication, and such that when the backscatter count rate changes, a difference between the ratemeter outputs which diminishes with time appears as a result of the different rates of response of the ratemeters to the change, an audible indicator device being connected to said detector means such that said differences will cause a change in the pitch of an audible indicator tone produced by said audible indicator device.

4,494,002

PISTOL-SHAPED DOSIMETER CHARGER

Robert A. Maples, Powell, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 24, 1983, Ser. No. 460,502
Int. Cl.³ G01T *1/142*
U.S. Cl. 250—377 **8 Claims**



1. An assembly for charging a cylindrical radiation dosimeter, comprising:

a hand-held, pistol-shaped housing including a handgrip and an elongate stock having a rear section which extends across one end of said handgrip and a forward section which projects laterally from said handgrip and terminates in a free end;

dosimeter abutment means attached to and projecting laterally from the free end of said stock, said dosimeter, when in a charging position on said assembly, extending lengthwise of said stock and one of its ends engaging said dosimeter abutment means;

a dosimeter clamping lever pivotally connected to said housing on the side of said handgrip remote from the laterally projecting section of said stock and including a lower section which extends lengthwise of said handgrip and an upper section which extends across and projects laterally from the adjacent end of said stock, the pivotal axis of said dosimeter clamping lever being perpendicular to the longitudinal axis of said stock;

means mounted on said housing for resiliently urging the upper section of said dosimeter clamping lever toward said dosimeter abutment means on said stock and against the other end of said dosimeter when the dosimeter is in said charging position on said assembly; and

manually actuated charging means carried by said housing for applying an electric current to said dosimeter when it is in said charging position on said assembly.

4,494,003

METHOD OF DETECTING GAMMA RADIATION BY PLACING GLASS DOPED WITH IRON IN AN ENVIRONMENT SUBJECT TO GAMMA RADIATION AND THEN MEASURING ANY COLOR CHANGED IN THE DOPED GLASS AS A FUNCTION OF GAMMA RADIATION

Adolph G. Hager, Pt. Pleasant; Gerald L. Freeman, Freehold Township, Monmouth County; James P. Rush, Union; Louis E. Branovich, Howell, and Stanley DuBuske, Lincroft, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1983, Ser. No. 472,441
Int. Cl.³ G01T *1/06*
U.S. Cl. 250—474.1 **2 Claims**

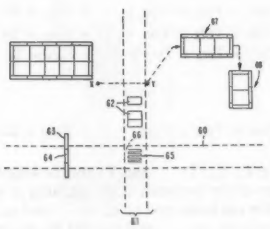
1. Method of detecting gamma radiation comprising placing iron doped glass in an environment subject to gamma radiation and then measuring any color change in the doped glass as a function to gamma radiation.

4,494,004

ELECTRON BEAM SYSTEM

John L. Mauer, IV, Sherman, Conn.; Michel S. Michail, Wappingers Falls, and Ollie C. Woodard, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 210,898, Nov. 28, 1980, abandoned. This application Jul. 1, 1983, Ser. No. 510,385
Int. Cl.³ H01J *37/302*
U.S. Cl. 250—492.2 **16 Claims**



1. In an electron beam system adapted for writing patterns within a writing field comprising:

means for defining an electron beam of predetermined cross section and density;

means for focusing said beam on a target area within the writing field;

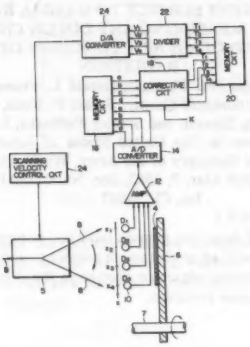
means for successively directing the beam, while blanked, along a path of a plurality of subfields of the writing field by a first deflection means until it reaches a preselected subfield; and

means for vectoring the beam, while blanked, to a preselected area within said subfield with a second deflection means, whereat the beam is unblanked and a predetermined pattern is written in the preselected area by the beam while the target area is stationary.

4,494,005
BEAM SCANNING CONTROL DEVICE FOR ION IMPLANTATION SYSTEM

Atsushi Shibata, and Yukichi Ueno, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 242,612, Mar. 11, 1981, abandoned.
This application Feb. 28, 1984, Ser. No. 584,386
Claims priority, application Japan, Mar. 11, 1980, 55-31337
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—492.2 10 Claims



1. A beam scanning control method for ion implantation, which comprises the steps of:

(1) generating an ion beam,

(2) scanning the ion beam in a predetermined direction in a predetermined range of scanning angle of the ion beam,

(3) arranging a plurality of detectors to space them apart from one another in the predetermined direction in the predetermined range of scanning angle of the ion beam, and

(4) calculating scanning rates of the ion beam at a plurality of scanning positions of the ion beam to substantially satisfy $\Sigma a = \Sigma b = \Sigma c = \ldots = \Sigma n = K$ (constant) in the following equations:

$$T_1a_1 + T_2a_2 + T_3a_3 + \ldots + T_na_n = \Sigma a$$
$$T_1b_1 + T_2b_2 + T_3b_3 + \ldots + T_nb_n = \Sigma b$$
$$T_1c_1 + T_2c_2 + T_3c_3 + \ldots + T_nc_n = \Sigma c$$
$$\vdots$$
$$T_1n_1 + T_2n_2 + T_3n_3 \quad \ldots + T_nn_n = \Sigma n$$

where T_1, T_2, T_3 . . . and T_n are the lengths of implantation time of the ion beam at the plurality of scanning positions of the ion beam, and a_1, a_2, a_3, . . . and a_n; b_1, b_2, b_3, . . . and b_n; c_1, c_2, c_3, . . . and c_n; and n_1, n_2, n_3, . . . and n_n are output signals of the detectors at each of the plurality of scanning positions of the ion beam.

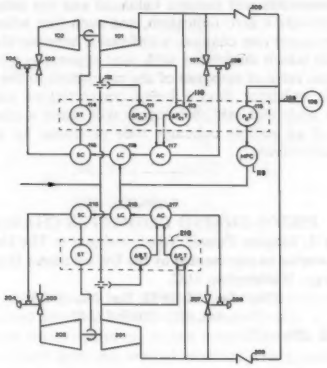
4,494,006
METHOD AND APPARATUS FOR CONTROLLING A MULTICOMPRESSOR STATION

Naum Staroselsky, and Saul Mirsky, both of Des Moines, Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa

Filed Sep. 15, 1982, Ser. No. 418,224
Int. Cl.³ F02C *6/10*; F04B *41/06*
U.S. Cl. 290—4 9 Claims

1. A method of controlling a compressor station receiving gas from an upstream process, compressing the gas and delivering it to a process downstream thereof, said compressor station having a station control means to adjust the station performance to the demand of a process located upstream or downstream, said compressor station including also a plurality of dynamic compressors driven by a plurality of respective prime movers, each of said dynamic compressors having a variable performance, a main control means associated with each of said compressors for changing its performance and a surge control means associated with each respective compressor for maintaining said respective compressor along a surge control line having a predetermined equation and located a predetermined distance from the respective surge limit of each respective compressor; said method comprising:

transforming said predetermined equation of each respective surge control line into a variable criterion representing a



relative distance between each respective compressor's operating point and its surge control line, said variable criterion reaching a predetermined value when said relative distance reaches zero value;

simultaneously changing the set points for all of said respective criterions representing the relative distance between each respective compressor's operating point and its surge control line by changing an output of said station control means to control the performance of said compressor station; and

keeping said set points equal and maintaining said criterion substantially equal at substantially all times for each of said respective compressors.

4,494,007
WIND MACHINE

Everett E. Gaston, Monroe, Nebr., assignor to Gaston Manufacturing, Inc., Monroe, Nebr.

Filed Sep. 2, 1982, Ser. No. 414,385
Int. Cl.³ F03D *7/00, 7/06, 3/00*; H02P *9/04*
U.S. Cl. 290—44 5 Claims

1. A wind-driven machine comprising:

a support tower having a rotating output shaft;

a plurality of wind-driven blades mounted for orbiting about said rotating output shaft to impart torque thereto;

each of said wind-driven blades having a blade axle about which it rotates;

means for adjusting the angle of said wind-driven blades with respect to their axles as said wind changes in velocity, whereby the speed of rotation of said rotating output shaft is controlled;

said means for adjusting the angle comprising control-vane means adapted to rotate about a control-vane-means axle so as to be substantially aligned with the direction of the wind;

a sprocket-and-chain assembly connecting said control-vane means to said wind-driven blade axles to adjust said wind-

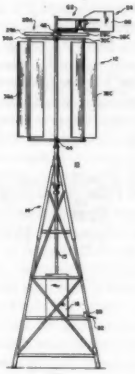
driven blade axles in position as said wind-driven blades orbit about said output shaft;

said means for adjusting including wind-responsive means adjusted to shift said sprocket-and-chain assembly in orientation about said control-vane-axle means, whereby the orientation of said wind-driven blades with respect to their axles is shifted as they orbit about said rotating output shaft;

brake-lever means for shifting the orientation of said sprocket-and-chain assembly by ninety degrees, whereby said blades are disoriented and orbiting is terminated;

said control-vane means having an angled portion of sufficient size to compensate for the friction of rotation about the axles of the wind-driven blades;

wind-gust-buffering means connected to said wind-responsive means for preventing shifting of said sprocket-and-



chain assembly of ninety degrees by gusts of wind less than four minutes in duration;

said rotating output shaft being adapted to be connected to a speed increaser;

said speed increaser having a low-speed end and a high-speed end;

said high-speed end having less surface-contact area with moving oil than said low-speed end;

a synchronous generator;

means connecting said speed increaser to said synchronous generator;

said synchronous generator having a field winding;

said field winding being adapted to be connected to a source of exciting frequency of sixty cycles per second, and

output means for said synchronous for supplying power at the frequency of said exciting-frequency source.

4,494,008

WIND-DRIVEN GENERATOR

Bennie N. Patton, 8227 Westridge Rd., Fort Wayne, Ind. 46825

Filed Mar. 3, 1933, Ser. No. 471,751

Int. Cl.³ F01D *23/00*

U.S. Cl. 290—44 **11 Claims**

1. A device for converting the kinetic energy of wind into useful work comprising:

a relatively fixed base;

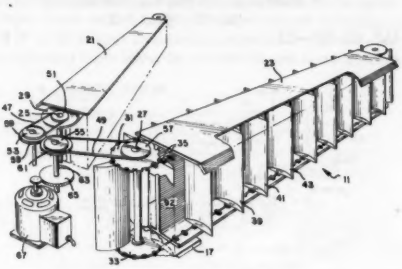
a platform supported on the base for free pivotal movement in a horizontal plane;

first and second elongated arms each supported on the platform near one arm end, each arm being pivotally supported on the base for limited movement between positions where the arms are nearly perpendicular to one another and positions where the arms are nearly parallel to one another;

cogwheel means journalled near opposed ends of each arm;

endless support means extending along each arm between opposed cogwheel means;

a plurality of vanes distributed along each endless support means and responsive to incident wind to move the end-



less support means and impart a rotary motion to the cogwheel means; and

electrical generating means coupled to the cogwheel means and responsive to rotation thereof to provide an electrical output.

4,494,009

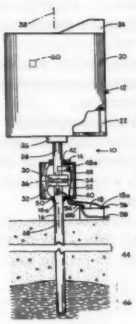
METHOD AND APPARATUS FOR CAPTURING AN ELECTRICAL POTENTIAL GENERATED BY A MOVING AIR MASS

Tex Yukl, Pleasant Valley Rte., Box 21, Baker, Oreg. 97814

Filed Sep. 19, 1983, Ser. No. 533,237

Int. Cl.³ F03D *5/04*; H02P *9/04*

U.S. Cl. 290—55 **4 Claims**



1. An earth-air electrical current friction generator which comprises

conductive earth means extending subsurface into a water table,

conductive airfoil means operatively associated with said earth means extending above surface into an air mass responsive to airflow to produce an electrical potential relative to said earth means,

isolation means electrically insulating said airfoil means from said earth means, said isolation means including a rotatable airfoil mounting means which allows said airfoil means to rotate in such an air mass and which supports said airfoil means above surface,

an electrical system, and

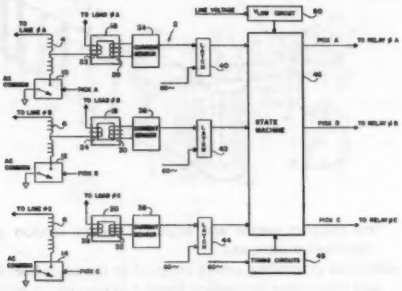
means for connecting said airfoil means and said earth means to said electrical system for conduction thereto of an electrical current.

4,494,010

PROGRAMMABLE POWER CONTROL APPARATUS RESPONSIVE TO LOAD VARIATIONS

Albert J. Donnelly, Santa Ana, Calif., assignor to Standum Controls, Inc., Santa Ana, Calif.

Filed Aug. 9, 1982, Ser. No. 406,138
Int. Cl.[3] H02J 3/00
U.S. Cl. 307—33 7 Claims



1. In an AC system of the type having a device for selectively reducing and increasing voltage applied to a load, an apparatus for sensing an increase in load current and for responding thereto by causing the load voltage device to increase load voltage for a selected period of time; the apparatus comprising:

means associated with said AC system for sensing load current in said system and for developing a signal indicative of a load current increase, and means connected to said load voltage device and responsive to said signal for causing an increase in load voltage for a selected period of time, said associated means comprising:

a transformer having a primary winding connected in series with said load, and a secondary winding, and

an amplifier circuit,

said transformer secondary winding being connected to said amplifier circuit for generating said signal indicative of load current increase,

said amplifier circuit comprising a reference voltage source, and a comparator circuit for generating said signal indicative of load current increase only when said current increase exceeds a predetermined threshold corresponding to said reference voltage,

said amplifier circuit also comprising means for varying the amplifier circuit gain whereby the amount of load current increase needed to exceed said threshold may be selectively varied.

4,494,011

HIGH VOLTAGE NANOSECOND PULSE GENERATOR

Stephen J. Davis, 3576 La Mesa, Hayward, Calif. 94542

Filed Mar. 15, 1982, Ser. No. 358,021
Int. Cl.[3] H03K 3/02
U.S. Cl. 307—106 5 Claims

1. Apparatus for generating pulse power of at least one half megawatt over a time interval of substantially two nanoseconds with short risetime, the apparatus comprising:

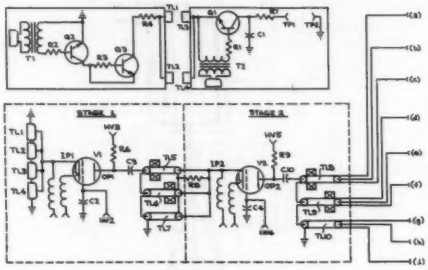
a high voltage avalanche source to provide up to two kilowatts power over a time interval of no more than one nanosecond in response to an input pulse for the apparatus;

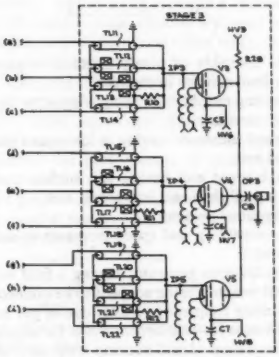
a first triode amplifier tube and circuit, with tube cathode electrically connected to the avalanche source output, with tube grid being grounded across a low capacitance capacitor and being further coupled to a first negative voltage source of at least 80 volts, and with tube anode being resistively connected to a voltage source of at least 8 kilovolts;

a first broadband voltage step-down transformer allowing a step-down of substantially 3:1, connected at its input end across an anode capacitor to the anode of the first triode tube;

a second triode amplifier tube and circuit, with tube cathode connected to the output of the first voltage step-down transformer, with tube grid being grounded across a second low capacitance capacitor and being further coupled to a second negative voltage source of at least 80 volts, and with the tube anode being resistively connected to a voltage source of at least 8 kilovolts;

second, third and fourth, substantially identical broadband voltage step-down transformers, arranged in parallel with each such transformer being connected to its input end





across a common second anode capacitor to the anode of the second triode tube;

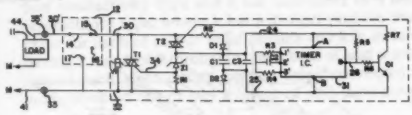
third, fourth and fifth, substantially identical triode amplifier tube and circuits, with tube cathodes being connected, respectively, to the outputs of the second, third and fourth voltage step-down transformers, with the third, fourth and fifth tube grids being grounded across third, fourth and fifth low capacitance capacitors, respectively, with the third, fourth and fifth tube grids being coupled to third, fourth and fifth sources of negative voltages, respectively, of voltage each substantially 80 volts, and with the anodes of the third, fourth and fifth triode tubes being resistively connected to a common voltage source of at least 8 kilovolts; and

with the anodes of the third, fourth and fifth triode tubes being coupled across a common third capacitor to the output point of the apparatus.

4,494,012
SWITCH TIMER

Charles W. Coker, Los Gatos, Calif., assignor to Intermatic Incorporated, Spring Grove, Ill.

Continuation-in-part of Ser. No. 314,963, Oct. 26, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,721
Int. Cl.³ H01H 43/04
U.S. Cl. 307—132 E 8 Claims



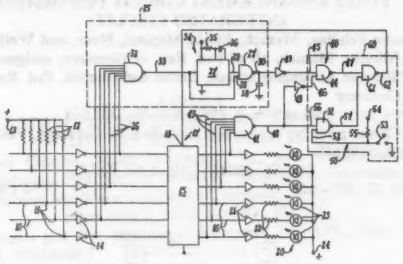
1. A controller to be connected across a first conductor extending to one terminal of a load device whose other terminal is connected to one of a pair of AC power lines having the applied voltage thereacross and a second conductor extending to the other power line, said controller comprising: parts support means adapted to be mounted in or upon a standard wall switch box, said parts support means having extending therefrom first and second controller input lead means to be respectively connected to said first and second conductors; said parts support means having mounted thereon a threeposition manually operable switch having a movable pole and stationary timer-on, power-off and load-on contacts to which said movable pole can make selective sequential engagement, a handle secured to said movable pole and projecting forwardly from said parts support means to project through a vertical slot in a cover plate and adapted to be moved vertically by the operator into any one of three stable positions where said movable pole selectively contacts one of said stationary contacts, said load-on contact being connected to said second controller input lead means and said movable pole being connected to said first controller input lead means so that when said movable pole is moved to said load-on contact the load device becomes energized, a timer which when energized supplies a control signal for a preset period of time, DC voltage producing means coupled between said timer-on contact and said second input lead means for developing a DC voltage to energize said timer, said DC voltage means including rectifier means and voltage storage means which is charged through the rectifier means when the AC applied voltage is coupled thereto, said timer having power input terminals coupled to said storage means to be energized therefrom, and power switch means having terminals connected between said timer-on contact and said second input lead means and adapted when in a low impedance condition to couple AC power to the load through said controller input lead means, said power switch means having a control terminal to which said control signal is coupled to effect a low impedance condition between said terminals which then interconnects said timer-on contact and second controller input lead means.

4,494,013
GATING CIRCUIT WITH SPURIOUS SIGNAL PREVENTION MEANS

Christopher J. Ludowyk, Melbourne, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU82/00011, § 371 Date Oct. 5, 1982, § 102(e) Date Oct. 5, 1982, PCT Pub. No. WO82/02808, PCT Pub. Date Aug. 19, 1982
PCT Filed Feb. 5, 1982, Ser. No. 438,875
Claims priority, application Australia, Feb. 6, 1981, PE7500
Int. Cl.³ H03K 17/56, 19/20
U.S. Cl. 307—241 9 Claims

1. A gating circuit including: a plurality of monitoring input lines each of which is arranged to receive an input signal of predetermined minimum duration in response to a predetermined change of condition of an externally monitored parameter; a main gate coupled to the monitoring input lines and having a plurality of output lines, a respective one output line being provided for each monitoring input line, the main gate also including an enabling input and being operable when an enabling signal is applied to said enabling input to apply a signal to the respective output line in response to said input signal of minimum duration being applied to one of the monitoring input lines; an input signal verifier circuit including a plurality of verifier input lines each coupled to a respective one of the monitoring input lines, the verifier circuit also including

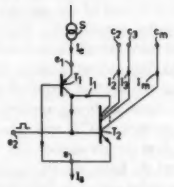


a verifier gate arranged to receive a direct gate input signal when any one of the monitoring input lines has said minimum duration input signal thereon and to receive a delayed gate input signal after a predetermined time delay less than said minimum duration when any monitoring input line has said input signal thereon, the verifier gate having a verifier output line coupled to said enabling input, the verifier gate being operable to provide said enabling signal on said verifier output line if, and only if, the direct and delayed gate input signals are being received thereby simultaneously.

4,494,014
ANALOGUE CURRENT SWITCH BIPOLAR INJECTION TECHNOLOGY

Joël A. Pelletier, Les Essarts le Roi, and Robert Breuillard, Deuil la Barre, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,265
Claims priority, application France, Jul. 3, 1981, 81 13141
Int. Cl.³ H03K 17/60, 19/091
U.S. Cl. 307—254 9 Claims



1. An analogue current-switching element comprising an integrated circuit injection logic gate of the I^2L type, that includes an injection transistor and a switching transistor, said element comprising a signal input coupled to an emitter of the injection transistor, a switching-signal input coupled to a base of the switching transistor, said switching transistor comprising a plurality of collectors, means coupling one of said collectors to the base of said switching transistor and other ones of said collectors to respective ones of a plurality of current inputs, a switching signal either turning on said switching transistor whereby a current supplied by a current source and injected at said signal input is reflected to said plurality of current inputs, or turning off said transistor whereby said

injected current is diverted towards the switching-signal input, and means connecting the base of said injection transistor to the emitter of said switching transistor to form a signal output junction point such that, in said turned-on state, said injected current is transferred to said signal output with a specific transfer coefficient which is a function of the characteristics of said transistors of the I^2L gate.

4,494,015

PULSE ENHANCEMENT CIRCUIT FOR DIGITAL INTEGRATED CIRCUIT

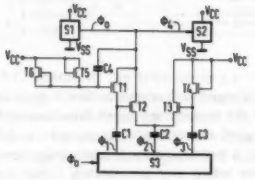
Focko Frieling, Munich; Ewald Michael, Haar, and Wolfgang Nikutta, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 347,031

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105147

Int. Cl.³ H03K *5/01, 5/02, 5/135*

U.S. Cl. 307—268 **4 Claims**



1. In an integrated digital MOS semiconductor circuit with a first circuit section serving as a pulse generator (S1) and a second circuit section (S2) serving as a pulse receiver, the input of which is controlled by two-level pulses supplied in part by first pulse signal (ϕ_0) from the first circuit section, the first pulse signal being fed at the same time via the source-drain path of a first transistor (T1) to a first terminal of a first capacitor (C1) and further, via a second transistor (T2) to a first terminal of a second capacitor (C2) which is connected via a third transistor (T3) to a supply potential (V_{CC}) which operates together with a reference potential (v_{SS}) to supply the first circuit section (S1) and the second circuit section (S2), the gate of the second transistor (T2) being connected to the source terminal of the first transistor (T1) and to the first terminal of the first capacitor (C1); said transistors (T1, T2, T3) being latching MOS field-effect transistors; the second terminals of the first capacitor (C1) and of the second capacitor (C2) each receiving digital pulse signals (ϕ_1, ϕ_2) supplied by a third circuit section; said third circuit section being responsive to the pulse signal of said first circuit section; the pulse pulse signal ϕ_1 being applied to the second terminal of the first capacitor (C1) and the pulse signal ϕ_2 being applied to the second terminal of the second capacitor (C2) and wherein the pulse signal ϕ_0 supplied by the first circuit section (S1) as well as the digital pulse signals ϕ_1 and ϕ_2 have simultaneous trailing edges, the leading edge of the pulse signal ϕ_0 delivered by the first circuit section (S1) occurring before the leading edges of the pulse signals ϕ_1 and ϕ_2, and the leading edge of the pulse signal ϕ_2 occurring no sooner than the leading edge of the pulse signal ϕ_1, the improvement comprising that the gate of the first transistor (T1) is connected to the supply potential (V_{CC}) through two further transistors (T5, T6) of the same type as the aforesaid transistors (T1 to T3); that a third capacitor (C4) is connected between the gate and the drain of the first transistor (T1); and that the gate of the first transistor (T1) is connected to the source terminals of the two further transistors (T5, T6) and to the gate of one of said further transistors (T6), the remaining terminals of said two further transistors (T5, T6) being connected to the supply potential (V_{CC}).

4,494,016

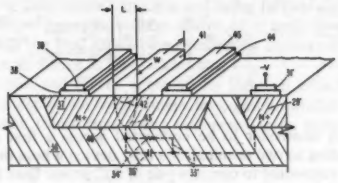
HIGH PERFORMANCE MESFET TRANSISTOR FOR VLSI IMPLEMENTATION

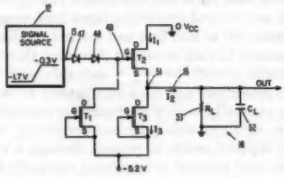
Stephen A. Ransom, Huntingdon Valley, and Todd K. Stickel, Chalfont, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,484

Int. Cl.³ H03K *19/017, 19/094, 19/20*

U.S. Cl. 307—450 **10 Claims**





8. A GaAs depletion mode transistor device connected in a power amplifier circuit, comprising:

said depletion mode transistor device having gate, source and drain terminals,

a uniform depth N+ ion implant region under said gate, source and drain terminals,

said N+ ion implant region having a uniform heavy dopant concentration greater than 2.5×10^{17} up to 5×10^{18} atoms per cubic centimeter providing a high threshold voltage,

said drain terminal being connected to a V_{CC} voltage source,

said source terminal being coupled to a reference source voltage,

an output line connected to said source terminal,

a high capacitive load connected to said source terminal and said output line, and

a low power digital input signal source connected to said gate terminal, whereby low current digital input signals applied to said gate terminal are translated to said output line as high current output signal.

4,494,017

COMPLEMENTARY DECODE CIRCUIT

Frank A. Montegari, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,166

Int. Cl.³ H03K *19/086, 19/20, 19/013*

U.S. Cl. 307—463 **19 Claims**

13. A decode circuit having n inputs for accepting n binary inputs where n is a positive integer, said decode circuit having 2^n output terminals, said decode circuit comprising:

2^n logic circuits, each of said 2^n logic circuits being similar one to another and having a like number of components, each of said 2^n logic cirucits including n+2 transistors, at least one transistor of said n+2 transistors of each of said 2^n logic circuits being a PNP transistor;

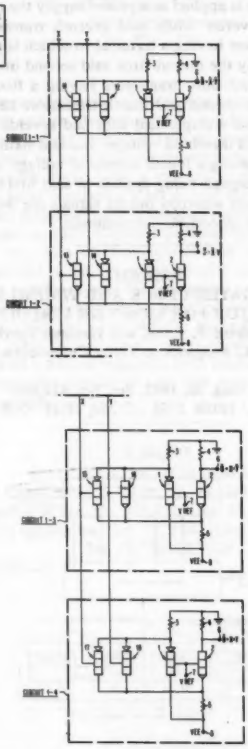
each of said 2^n logic circuits having n inputs respectively connected to said n inputs of said decode circuit;

each of said 2^n logic circuits having an output connected to a predetermined one of said 2^n output terminals of said decode circuit;

and said decode circuit being further characterized in that a decode function is accomplished in a single logic level, each of said 2^n logic circuits having an input circuit portion and output circuit portion;

each said input circuit portion of said 2^n logic circuits comprising n transistors, each of said n transistors of each of said 2^n input circuit portions having an emitter, base and collector;

each of said input circuit portions having k transistors of a first conductivity type and a n-k transistors of a second conductivity type, where k has a distinct positive integer value for each of said 2^n logic circuits and k is an integer having a range of 0 through n, each base of said n transistors of each input circuit portion being connected to a predetermined one of said n inputs of said logic circuit;



each of said input circuit portions of said 2^n logic circuits having first passive circuit means connecting in common said collectors of said k transistors of said first conductivity type and said emitters of said n-k transistors of said second conductivity type and second passive circuit means connecting in common said emitters of said k transistors of said first conductivity type and said collectors of said n-k transistors of said second conductivity type,

each of said output circuit portions of said 2^n logic circuits comprising, a first transistor of a first conductivity type having an emitter, base and collector and a second transistor of a second conductivity type having an emitter, base and collector, said emitter of said transistor of said second conductivity type being connected to said first passive circuit means of said input circuit portion, said emitter of said transistor of said first conductivity type being connected to said second passive circuit means of said input circuit portion, a first resistor connected between the emitter of said second transistor and a first source of potential, a second resistor connected between said collector of said first transistor and said first source of reference potential, a third resistor connected between said emitter of said first transistor and a third source of potential, said collector of said second transistor being connected to said third source of potential, said base of said first transistor and said base of said second transistor being connected to a second source of potential and said output terminal of said logic circuit being connected to said collector of said first transistor.

4,494,018

BOOTSTRAPPED LEVEL SHIFT INTERFACE CIRCUIT WITH FAST RISE AND FALL TIMES

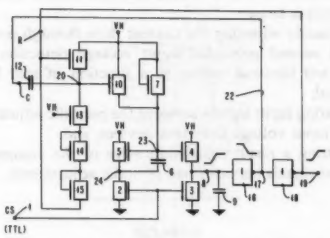
Rainer Clemen, South Burlington, Vt., and Werner Haug, Böblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1982, Ser. No. 374,113

Claims priority, application European Pat. Off., May 13, 1981, 81103660.7

Int. Cl.³ H03K *19/094, 5/02, 19/20*

U.S. Cl. 307—482 **6 Claims**



1. In an input circuit having an input node and an output node, for a monolithically integrated semiconductor storage of field effect transistors, which input circiut is controlled with low signal levels applied to its input node and which input circuit for level conversion uses bootstrap means, and which input circuit contains a dynamically operating charge-up circuit for charging up a bootstrapping node of the bootstrap means to the operating voltage, the improvement in the charge-up circuit comprises:

a coupling capacitor having an input node and an output node;

a first inverter having its input connected to the output node of the input circuit and its output connected to the input node of the coupling capacitor;

first and second FET's, the gate of the first FET and the source of the second FET being connected to the output node of said coupling capacitor, the drain of said first and second FET's being connected in common to a voltage source;

a discharge circuit having one end connected to the output node of the coupling capacitor, the opposite end of the discharge circuit being connected to the gate of the second FET;

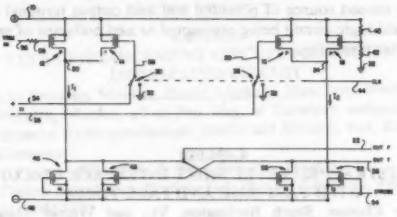
a second inverter having its input connected to the output of the first inverter and its output connected to the gate of the second FET;

said first FET having its source connected to the said bootstrapping node of the bootstrap means, whereby the charge-up circuit causes the bootstrap means to be maintained at full operating voltage.

4,494,019
LOW LEVEL SIGNAL COMPARATOR APPARATUS

James L. Brown, Toddville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 18, 1982, Ser. No. 409,373
Int. Cl.³ H03K 5/24
U.S. Cl. 307—491 5 Claims



1. The method of compensating comparator apparatus imbalances comprising the steps of:

periodically detecting the current amplitude of a first analog input signal as compared to the current amplitude of a second analog input signal;

outputting one of two logic values as a feedback signal indicative of which of said first and second analog input signals is larger;

periodically adjusting the current flow through one of first and second grounded input voltage detection devices toward identical values as a function of said feedback signal;

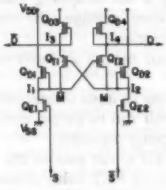
comparing input signals between the periodic adjustments of the input voltage detection devices; and

outputting a result signal indicative of the comparison of input signals between said periodic adjustments.

4,494,020
HIGH SENSITIVITY SENSE AMPLIFIER USING DIFFERENT THRESHOLD VALUED MOS DEVICES

Satoshi Konishi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 13, 1983, Ser. No. 484,468
Int. Cl.³ H03K 5/24; G01R 19/165; G11C 7/06
U.S. Cl. 307—530 5 Claims



1. A sense amplifier comprising:

(a) a first inverter comprising a series circuit of a first transistor which is a driving transistor and which has a first input terminal and a second transistor which is a load transistor;

(b) a second inverter comprising a series circuit of a third transistor which is a driving transistor and which has a second input terminal and a fourth transistor which is a load transistor;

(c) a third inverter comprising a series circuit of a fifth transistor which is a driving transistor and to which is applied as an input the output of said second inverter and a sixth transistor which is a load transistor, the junction between said fifth and sixth transistor being a first output terminal;

(d) a fourth inverter comprising a series circuit of a seventh transistor which is a driving transistor and to which is applied as an input the output of said first inverter and an eighth transistor which is a load transistor, the junction between said seventh and eighth transistor being a second output terminal;

(e) each of said load transistors of said first through fourth inverters having a terminal connected to a first power supply means;

(f) said first and third transistors in said first and second inverters having terminals connected to a second power supply means;

(g) said fifth transistor in said third inverter having a terminal to which is applied as a power supply the output from said first inverter while said seventh transistor in said fourth inverter having a terminal to which is applied as a power supply the output from said second inverter;

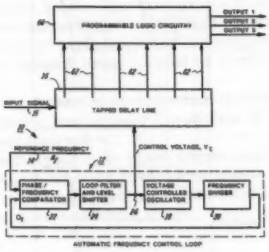
(h) said first and third transistors having a first threshold voltage, said second and fourth transistors having a second threshold voltage, said fifth and seventh transistors having a third threshold voltage, and said sixth and eighth transistors having a fourth threshold voltage; and

external input signals being applied to said first and second input terminals whereby output signals are derived from said first and second output terminals.

4,494,021
SELF-CALIBRATED CLOCK AND TIMING SIGNAL GENERATOR FOR MOS/VLSI CIRCUITRY

Alan G. Bell; Richard F. Lyon, and Gaetano Borriello, all of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1982, Ser. No. 412,490
Int. Cl.³ H03K 5/06, 17/284; H03L 7/08
U.S. Cl. 307—591 8 Claims



1. A self-calibrated clock and timing signal generator to provide arbitrary digital waveforms of preselected edge resolution comprising

multistage means to produce a time delayed signal of preselectable edge resolution from a plurality of outputs between successively coupled delay stages comprising said multistage means, the delay per stage of said multistage means being equal so that the selection of any one of said outputs is representative of a predetermined amount of delay provided to an input signal to said multistage means and

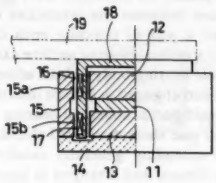
calibrating means including a voltage control oscillator having a plurality of delay stages, each of identical structure to each of said multistage means delay stages, said calibrating means to develop a control signal and apply said control signal to said multistage means to continuously maintain said predetermined amount of delay per stage.

4,494,022

ELECTROMAGNETIC FORCE-TRANSDUCER

Toshio Kawara, Kyoto, and Yoshihumi Shibahara, Shiga, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 23, 1984, Ser. No. 592,583
Claims priority, application Japan, Jun. 10, 1983, 58-104729
Int. Cl.³ H02K *41/00*; G01G *3/14*
U.S. Cl. 310—14 6 Claims



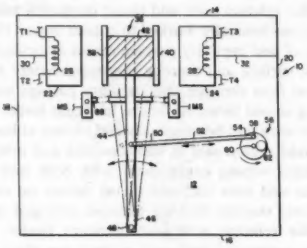
1. An electromagnetic force-transducer comprising a magnetic circuit and an electromagnetic coil kept movable in the static-magnetic field provided by said magnetic circuit, and being devised to have said electromagnetic coil produce an electromagnetic force with a current supplied thereto, said magnetic circuit containing a permanent magnet and comprising an inner magnetic path positioned inside said electromagnetic coil and an outer magnetic path surrounding said electromagnetic coil, said electromagnetic coil consisting of two coaxial parallel windings mechanically connected to each other with a distance kept therebetween, and one of said two coaxial parallel windings being supplied with a first magnetic field intersecting the same radially by said magnetic circuit, while the other of said two coaxial parallel windings being supplied with a second magnetic field intersecting the same in the direction anti-parallel to said first magnetic field by said magnetic circuit.

4,494,023

MAGNETIC MOTOR MACHINE

Raymond Cook, Box 2A, Basin, W. Va. 24727

Continuation of Ser. No. 330,522, Dec. 14, 1981, abandoned.
This application Nov. 28, 1983, Ser. No. 555,413
Int. Cl.³ H02K *7/00*
U.S. Cl. 310—21 2 Claims



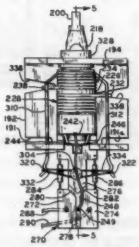
1. A magnetic motor machine comprising:
a housing having side walls, end walls and top and bottom walls;
a pair of electromagnets secured in spaced apart relationship to insulating braces attached to said side walls within the housing;
power supply means energizing each of said electromagnets;
means associated with said power supplies for alternatively connecting said power supplies to said electromagnets whereby said electromagnets are alternatively energized;
a yoke reciprocable between said electromagnets and comprising metallic faces having an insulation block therebetween;
a support shaft attached at one end to said insulation block of said yoke and attached at its opposite end to a fixed bearing;
said fixed bearing comprising a rod extending between said end walls and rigidly fixed thereto;
an output shaft fixed at one end to said support shaft midway between the yoke and the fixed bearing, the opposite end attached to an eccentric; and
offset stub shaft means on the eccentric extending to the exterior of the housing and rotated in response to reciprocation of said yoke and said output shaft whereby machinery external of said magnetic motor may be operated.

4,494,024

ONE SHOT SPRING ACTIVATED MOTOR

Gerald W. Braun, Avilla, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Nov. 28, 1983, Ser. No. 555,517
Int. Cl.³ H02K *7/00*; H01H *29/00*
U.S. Cl. 310—75 A 12 Claims



1. Motor apparatus comprising
an elongated motor shaft having a shaft axis;
first means for supporting said shaft for rotation from an initial rotative position about said axis;
second mechanical means for applying a first torque in a first rotational direction from said initial rotative position to said shaft;
third mechanical means for applying a second torque in a second rotational direction from said initial rotative position to said shaft;
fourth means for selectively releasing the torque of one of said second and third means to impart rotation to said shaft in either said first and second rotational directions from said initial rotative position.

4,494,025

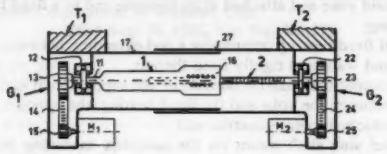
LINEAR DRIVE DEVICE WITH TWO MOTORS

Hans Fickler, Weidstrasse 18, CH 8542 Wiesendangen, Switzerland

Filed Apr. 23, 1984, Ser. No. 603,235
Claims priority, application Switzerland, Apr. 29, 1983, 2303/83
Int. Cl.³ H02K *7/06*, *7/20*; F16H *21/16*
U.S. Cl. 310—80 7 Claims

1. A linear drive device with a screw spindle and a nut with two drive motors, characterized by the fact that one motor (M_2) drives the screw spindle (2) via a first intermediate drive

and the other motor (M_1) drives the nut (16) by means of a hollow shaft (1) via a second intermediate drive (13–15) and



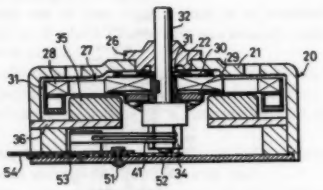
that the two intermediate drives have a very slight but precisely defined difference in their transmission ratio.

4,494,026

BRUSH-MOUNTING STRUCTURE OF MINIATURE MOTOR

Masaru Abe, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,719
Claims priority, application Japan, Jul. 1, 1982, 57-99876[U]
Int. Cl.³ H02K 9/00
U.S. Cl. 310—89 **3 Claims**



1. In a motor having a case carrying a bearing in an upper wall portion and having an open bottom, a rotary shaft rotatably held by said bearing and carrying a rotor, a permanent magnet fixed within said case so as to oppose said rotor in proximity thereto, and brushes lying in contact with a commutator mounted on said rotor shaft; means for mounting said brushes within said motor, said means including a bracket made of a metal plate and held across the open bottom of said case, said bracket having a plastic film lying thereover, and terminal plates each secured onto said plastic film and having upstanding bent portions holding said brushes, said terminal plates being secured by rivets formed of insulating material and extending through said plastic film and said bracket.

4,494,027

DYNAMOELECTRIC MACHINE WITH SELF-ADJUSTING BEARING

Charles W. Otto, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 377,554, May 12, 1982, Pat. No. 4,466,165.
This application May 18, 1984, Ser. No. 611,580
Int. Cl.³ H02K 5/00, 5/16
U.S. Cl. 310—89 **5 Claims**

1. A dynamoelectric machine adapted for connection across a power source comprising:

a stator having winding means associated therewith for excitation when the dynamoelectric machine is connected across the power source;

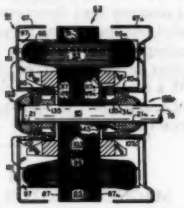
a rotor arranged in magnetic coupling relation with said stator so as to be rotatable upon the excitation of said winding means;

a shaft rotatably mounted with said rotor;

at least one thrust device associated with at least one of said rotor and said shaft so as to be rotatable therewith;

at least one sheet metal end shield mounted in association with said stator and including a partial spherical bearing seating surface deformed from said at least one sheet metal end shield, and at least a pair of keys deformed from said at least one sheet metal end shield so as to extend generally radially with respect to said partial spherical bearing seating surface, respectively;

a lubrication and bearing system including a bearing having a body of sintered metal material with a plurality of capillary passage means for lubricant flow extending therethrough defined between the interstices of the sintered metal material, a pair of opposite ends on said bearing body, a partial spherical bearing surface extending peripherally about said bearing body at least adjacent one of said opposite ends and engaged in at least limited self adjusting relation with said partial spherical bearing seating surface on said at least one sheet metal end shield, a bore in said bearing body extending generally axially between said opposite ends thereof and arranged in journaling engagement with a part of said shaft, at least a pair of keyways in said bearing body intersecting with said one opposite end and extending between said bore and said partial spherical bearing surface, respectively, said at least key pair deformed from said at least one sheet metal end shield being received within said at least keyway pair in antirotational engagement with said bearing body, a generally cylindric surface extending peripherally about said bearing body between said partial spherical bearing surface and the other of said opposite ends of said bearing body, at least



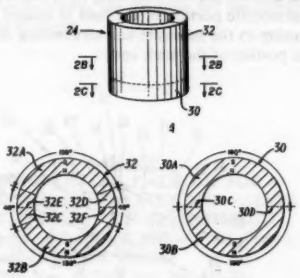
one notch in said bearing body intersecting with said other opposite end thereof and extending between said bore and said cylindric surface, said other opposite end defining a thrust surface on said bearing body arranged in thrust transfer relation with said thrust device on said shaft and being mechanically worked to at least in part close at least some of said capillary passage means associated with said thrust surface and thereby predeterminately regulate lubricant flow through said capillary passage means terminating at said thrust surface, a lubricant feeder wick associated with said bearing body and having at least one part disposed within said at least one slot and extending into lubricant wiping engagement with both said shaft part within said bore and said thrust device on said shaft, a lubricant storage wicking material arranged in lubricant transfer relation with said lubricant feeder wick, and means connected with said at least one sheet metal end shield generally radially outwardly of said partial spherical bearing seating surface formed thereon and extending generally toward said rotor for containing said lubricant storage wicking material, the lubricant being transferred from said lubricant storage wicking material through both said capillary passage means in said bearing body and said lubricant feeder wick into said bore of said bearing body to lubricate said shaft part journaled therein and also through said at least one part of said lubricant feeder wick to said thrust device to establish a hydrodynamic film of the lubricant between said thrust surface on said bearing body and said thrust device.

4,494,028

INTEGRAL COAXIAL COMMUTATION AND ROTOR MAGNETS AND APPARATUS AND METHOD FOR MAKING SAME

Fred A. Brown, Woodstock, N.Y., assignor to Rotron Incorporated, Woodstock, N.Y.

Filed Sep. 30, 1982, Ser. No. 428,828
Int. Cl.³ H02K 23/04
U.S. Cl. 310—156 12 Claims



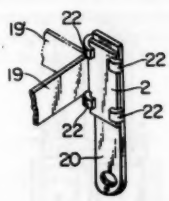
1. An integral annualr field and commutation magnet for a brushless DC motor formed on a single piece of permanently magnetized material and including a first annular field magnet portion at a first location and a second annular commutation magnet portion at a second location axially displaced from the first location, said field magnet portion having magnetized and unmagnetized sectors, said unmagnetized sectors being substantially unmagnetized portions of the magnetic material of said piece, being adjacent to magnetized sectors of the field magnet portion and integral therewith and having a substantial angular length.

4,494,029

BRUSHGEAR

Michio Hoshino, Kashiwa, and Riyouichi Someya, Matsudo, both of Japan, assignors to Mabuchi Motor Co., Ltd., Japan

Filed Aug. 16, 1983, Ser. No. 523,417
Claims priority, application Japan, Aug. 30, 1982, 57-130936[U]
Int. Cl.³ H02K 13/00
U.S. Cl. 310—239 13 Claims



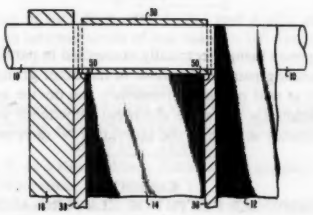
1. Brushgear having brushes, each comprising a terminal and a brush arm, made of electrically conductive metal strips and joined together into one piece, said brushes being held in position on a side plate of a motor case made of a synthetic resin, by being inserted into terminal holes provided on said motor case side plate; characterized in that said terminal has a terminal strip and joining members provided integrally with said terminal strip at an end of said terminal strip, and said brush arm has a brush base and a brush strip; the brush base being at least partly wrapped by said joining members which joining members are in a folded and depressed condition against said brush base; said terminal strip extending at a substantially right angle with respect to said brush strip with said terminal and said brush arm joined at a joined portion comprising said brush base and joining members; and the joined portion of said joining members and said brush base being inserted into one of the terminal holes.

4,494,030

APPARATUS FOR PREVENTING OVERFLUX DAMAGE TO STATOR CORES

Arthur Mulach, Delmont, and Raymond Calfo, Braddock Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1981, Ser. No. 318,231
Int. Cl.³ H02K 1/12
U.S. Cl. 310—256 3 Claims



1. A dynamoelectric machine, comprising:

a stator member comprising a frame structure, a cylindrical stator core structure and at least one building bolt axially disposed along the outside surface of said stator core structure and generally parallel to the central axis of said cylindrical stator core structure, said stator core structure comprising a plurality of laminations;

means for preventing electrical communication between said building bolt and a preselected number of said laminations, said preventing means comprising an insulative cylinder disposed about said building bolt proximate said preselected number of laminations;

a first layer of plates disposed between said preselected number of laminations and the remainder of said stator core laminations, said first layer of plates being shaped to receive said insulative cylinder; and

a second layer of plates disposed adjacent said preselected number of laminations on the opposite axial side of said preselected number of laminations from said first layer of plates, said preselected number of laminations being disposed between said first and second layers of plates, said second layer being shaped to receive said insulative cylinder, said first and second layers of plates being made of stainless steel and being thicker than said laminations.

4,494,031

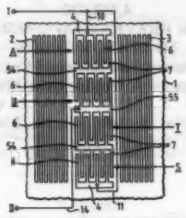
HIGH POWER ACOUSTIC WAVE ARRANGEMENT WITH N^2 PARALLEL-SERIES CONNECTED ACOUSTIC WAVE DEVICES

Christopher S. Barnes, Reigate; Paul A. Moore, Hove, and Philip D. White, Chessington, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,800
Claims priority, application United Kingdom, Mar. 24, 1982, 8208659
Int. Cl.³ H03H 9/25; H01L 41/08
U.S. Cl. 310—313 B 17 Claims

1. An acoustic wave device arrangement comprising at least one piezo-electric substrate including N^2 acoustic wave devices in which at the same operating frequency each of the devices have substantially the same electrical impedance and transfer characteristics, where N is an integer greater than unity, each device having at least one pair of terminals for coupling power into and out of said device, said N^2 devices

being electrically connected in a parallel-series arrangement comprising N groups each of which comprises N of said devices with the corresponding pairs of terminals being electrically connected in series, the corresponding pairs of terminals



in each group being electrically connected in parallel with the corresponding pairs of terminals in the other group or groups whereby at said operating frequency the device arrangement has substantially the same electrical impedance and transfer characteristics as each of the individual N^2 devices.

4,494,032

TRANSDUCER PLATE FOR ELECTRO-ACOUSTIC TRANSDUCERS

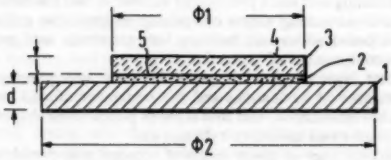
Erwin Martin, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,267

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232177

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—324 **6 Claims**



1. In a transducer plate for electro-acoustic transducers for telephone apparatus formed by a piezoelectric ceramic layer provided with electrodes on both sides and connected with a support plate, the improvement wherein the transducer plate required for a microphone, a receiver or tone ringer has a transducer plate diameter between 40 and 45 mm, a ceramic diameter between 25 and 35 mm, a transducer plate thickness between 100 and 250 microns, and a ceramic thickness between 50 and 150 microns.

4,494,033

THIN LEAD SUSPENSION FOR A PIEZOELECTRIC RESONATOR

William C. Morse, Newbury, and John B. Phaneuf, Haverhill, both of Mass., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,934

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—352 **11 Claims**

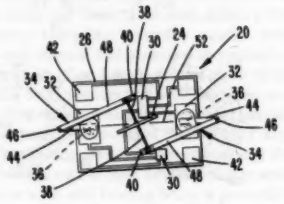
1. A first electrical device for supporting a second electrical device, which comprises:

a substrate having a pair of spaced contact pads formed on the substrate in a plane of the substrate adjacent opposite edges of the substrate; and

a pair of unitary leads having inner end portions bonded to respective ones of the contact pads on the substrate so as to extend essentially in the plane of the substrate;

each of the pair of unitary leads further including a reverse-bent first intermediate portion extending from the inner end portion of the lead outward beyond an adjacent one of the edges of the substrate and also projecting in a direction essentially perpendicular to the substrate out of the plane of the substrate:

each of the pair of unitary leads also including a second intermediate portion extending from the reverse-bent first intermediate portion of the lead in spaced opposed relationship to the substrate and terminating in an outer free end portion of the lead; and



the second intermediate portions of the unitary leads being bent transversely with respect to the first intermediate portions of the leads in opposite directions essentially parallel to the substrate such that the second intermediate portions and the outer free end portions of the leads are disposed on respective opposite sides of a plane extending from an imaginary line interconnecting the contact pads on the substrate, and such that the second intermediate portions of the leads extend essentially parallel to one another with the outer free end portions of the leads in opposed spaced relationship for the reception of the second electrical device therebetween.

4,494,034

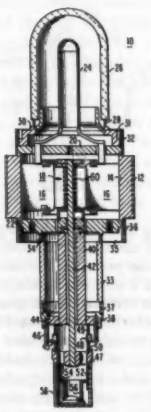
MAGNETRON FILAMENT HAVING A QUADRILATERAL CROSS-SECTION

Robert F. Keller, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,402

Int. Cl.³ H01J *1/15, 19/08;* H01K *1/02*

U.S. Cl. 313—341 **5 Claims**



1. In a magnetron having an evacuated envelope including

therein a high temperature cathode assembly and an anode electorde surrounding said cathode assembly, wherein the improvement comprises

said high temperature cathode assembly being formed of a helically wound filament having a quadrilateral cross-section, wherein one of said surfaces of said wound filament is wider than the others, the wider surface facing said anode electrode, the wider surface of said wound filament being held in tension and the oppositely disposed surface being placed in compression, said quadrilateral cross-section thereby increasing the strength and sag resistance of said wound filament.

4,494,035

THERMOELECTRIC CATHODE FOR A HYPERFREQUENCY VALVE AND VALVES INCORPORATING SUCH CATHODES

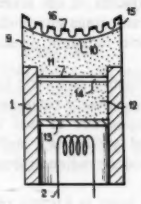
Pierre Palluel, and Arvind Shroff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 4, 1981, Ser. No. 318,316

Claims priority, application France, Nov. 7, 1980, 80 23884

Int. Cl.³ H01J *1/14, 19/06;* H01K *7/04*

U.S. Cl. 313—346 R **11 Claims**



1. A thermoelectronic cathode comprising a cylindrical casing separated by a wall in two portions, the lower portion containing a heating filament and the upper portion forming a cavity chamber containing a porous body impregnated with emissive material covered by a non-impregnated body, wherein a conducting metal in powder form having a high melting point is provided between the impregnated porous body and the non-impregnated porous body, and wherein the porosity of the non-impregnated body is between 16 and 21% and the porosity of the impregnated body is between 16 and 50%.

4,494,036

ELECTRON BEAM WINDOW

Armand P. Neukermans, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 443,709, Nov. 22, 1982, Pat. No. 4,455,561. This application Mar. 19, 1984, Ser. No. 590,934

Int. Cl.³ H01J *33/04*

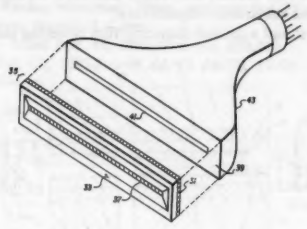
U.S. Cl. 313—420 **4 Claims**

1. A device for injecting electrons into an atmosphere having a pressure of one atmosphere or higher comprising:

an evacuated CRT assembly;

a faceplate having a hole therein, attached to said CRT assembly; and

a vacuum window covering said hole, said vacuum window comprising a film of material selected from the group



consisting of SiC, B_4N, BN, Si_3N_4, and Al_4C_3, said film having an internal stress of less than 2×10^9 dynes/cm^2.

4,494,037

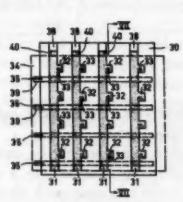
GAS DISCHARGE DISPLAY DEVICE HAVING ANODIZED AND UNANODIZED ELECTRODE SURFACE AREAS

Gerhard H. F. de Vries, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 270,679, Jun. 4, 1981, Pat. No. 4,389,277. This application Sep. 9, 1982, Ser. No. 416,182

Int. Cl.³ H01J *17/49, 61/067*

U.S. Cl. 313—584 **4 Claims**



1. A gas discharge display device comprising an envelope of a first and second glass plate having a gas discharge space therebetween, a first pattern of aluminum electrodes on said first glass plate in facing relationship to a second pattern of electrodes on said second glass plate, a gas filled area between said first and second pattern of electrodes, and a plurality of small surface elements constituting cathode areas formed on surface portions of said first pattern of aluminum electrodes which are anodized except for said cathode areas.

4,494,038

GAS DISCHARGE DEVICE

Donald K. Wedding; Michael E. Fein, both of Toledo; Roger E. Ernsthausen, Luckey, and Bernard J. Byrum, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 556,777, Mar. 10, 1975, , which is a continuation of Ser. No. 417,961, Nov. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,784, Oct. 25, 1972, abandoned, which is a division of Ser. No. 249,207, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 173,294, Aug. 19, 1971, abandoned. This application Jan. 19, 1976, Ser. No. 650,382

The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.

Int. Cl.³ H01J *17/49*

U.S. Cl. 313—587 **18 Claims**

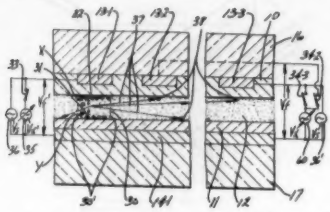
1. A plasma display panel comprising:

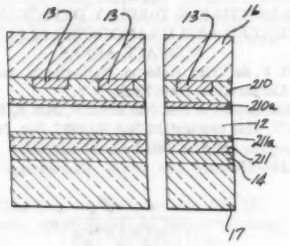
(a) a first and a second dielectric substrate, said first and second substrates being spaced from each other and sealed, a discharge gas contained within said sealed sub-

strates forming a discharge gas space, at least one of said substrates being transparent;

(b) first and second electrodes mounted on said first and second substrates, respectively;

(c) a first and a second dielectric film covering said first and





said second electrodes, respectively, said films facing said discharge gas space; and

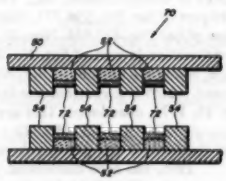
(d) a surface reinforcing film only on one of said dielectric films, said reinforcing film having a major component made from an oxide of a rare earth element selected from the group consisting of CeO_2 and La_2O_3.

4,494,039

GYROTRON TRAVELING-WAVE DEVICE INCLUDING QUARTER WAVELENGTH ANTI-REFLECTIVE DIELECTRIC LAYER TO ENHANCE MICROWAVE ABSORPTION

Kyung J. Kim, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 19, 1982, Ser. No. 435,155
Int. Cl.³ H01J 25/00
U.S. Cl. 315—4 **13 Claims**



1. A drift tube

for use between an electron gun and a cavity in a gyrotron traveling-wave device comprising:

a hollow waveguide positioned to surround an electron beam passing from said electron gun to said cavity, said waveguide enclosing a medium through which said electron beam travels;

a plurality of parallel highly lossy dielectric suppressor rings surrounding said electron beam and located adjacent to the inner surface of said waveguide, said suppressor rings acting to absorb parasitic radiation produced by said electron beam; and

an anti-reflective layer for matching the impedance of said suppressor rings to said medium and for reducing reflections of incident radiation from the surfaces of said suppressor rings located on the surfaces of said plurality of suppression rings, said anti-reflective layer being formed of a dielectric material having a dielectric constant determined according to the equation:

$$\epsilon_{layer} = \sqrt{(\epsilon_{medium})(\epsilon_{substrate})}$$

where ϵ_{layer} is the dielectric constant of said coating layer, ϵ_{medium} is the dielectric constant of said medium, and $\epsilon_{substrate}$ is the dielectric constant of said suppressor rings.

10. A method for reducing parasitic oscillations within a gyrotron traveling-wave device comprising the steps of:

providing a hollow waveguide drift tube positioned between an electron gun and a cavity in said gyrotron, said drift tube surrounding an electron beam passing between said electron gun and said cavity;

forming a plurality of parallel highly lossy dielectric suppressor rings adjacent to the inner surface of said drift tube, said suppressor rings surrounding said electron beam to absorb parasitic radiation produced by said electron beam; and

forming an anti-reflective dielectric layer on the surfaces of said plurality of suppressor rings, said anti-reflective layer matching the impedance of said suppressor rings to a medium enclosed within said drift tube and reducing reflections of incident radiation from the surfaces of said suppressor rings,

said anti-reflective layer is formed of a material having a dielectric constant determined according to the equation:

$$\epsilon_{layer} = \sqrt{(\epsilon_{medium})(\epsilon_{substrate})}$$

where ϵ_{layer} is the dielectric constant of the anti-reflective layer, ϵ_{medium} is the dielectric constant of said medium, and $\epsilon_{substrate}$ is the dielectric constant of said suppressor rings.

4,494,040

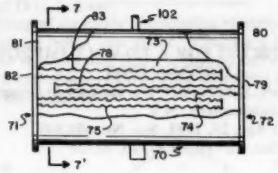
RADIO FREQUENCY QUADRUPOLE RESONATOR FOR LINEAR ACCELERATOR

Alfred Moretti, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1982, Ser. No. 435,181
Int. Cl.³ H01J 25/10
U.S. Cl. 315—5.41 **7 Claims**

1. An RFQ resonator for a linear accelerator comprising a cylinder member with a longitudinal axis, an even plurality of modulating, elongated resonating members extending in an axial direction, supported in the cylinder and arranged to form an LC resonant circuit with the inductance being formed along the length of the resonating members to provide a low resonant frequency useful for accelerating heavy particles in the linear

accelerator, the capacitance of the LC circuit being based on the equation



$$\cos^{-1}\left(\frac{2\pi l}{\lambda}\right) = \frac{2C_{12}}{C_{11}}$$

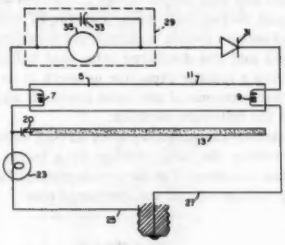
where l is the length of the resonator, λ is the wavelength of the wave, C_{12} is the capacitance between adjacent members and C_{11} is the capacitance between one member and other members and ground, the adjacent resonating members being alternately shorted or open with respect to one end of said cylinder member and power means connected to the cylinder member for generating a multipole electrical field in the vicinity of said axis and a magnetic field transverse to said axis.

4,494,041

INCANDESCENT BALLAST ASSEMBLY

William J. Roche, Merrimac, and John W. Anderson, Jr., Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 2, 1983, Ser. No. 463,226
Int. Cl.³ H01J 7/44
U.S. Cl. 315—49 **8 Claims**



1. An incandescent ballast assembly for a fluorescent lamp having a filament winding at each end and a longitudinal axis extending between the filament windings, said ballast assembly comprising:

starter and unidirectional conduction device means connected in series with said filament windings at each end of said fluorescent lamp;

starting aid means extending along the longitudinal axis of and contacting said fluorescent lamp;

an incandescent lamp series connected to a filament at one end of said fluorescent lamp;

a pair of terminals formed for connection to a potential source and connected to said incandescent lamp and to said filament at the other end of said fluorescent lamp; and

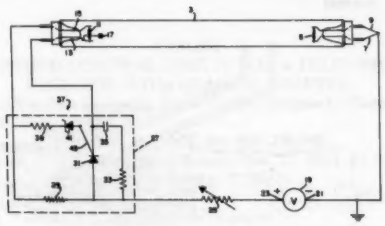
impedance means coupling said starting aid means to a junction of said incandescent lamp and to said filament at said one end of said fluorescent lamp.

4,494,042

MERCURY TARGET SENSING AND LOCATING APPARATUS

William J. Roche, Merrimac, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 16, 1982, Ser. No. 368,939
Int. Cl.³ H01J 7/44, 13/46, 19/78, 29/96
U.S. Cl. 315—56 **12 Claims**



1. Apparatus for coupling a fluorescent lamp to a DC potential source, said fluorescent lamp having a first coil at one end, a second coil with a pair of connected electrical leads at the opposite end with a mercury dispensing target affixed to one of said pair of electrical leads, said apparatus formed for selectively applying energy from said DC potential source to said electrical lead having said mercury dispensing target affixed thereto and comprising:

means for coupling said DC potential source to said first coil of said fluorescent lamp;

a ballast connected to said DC potential source; and

voltage discriminator means coupling said ballast to said second coil of said fluorescent lamp, said voltage discriminator means including an impedance coupling said ballast to one and a rectifier coupling said ballast to the other one of said pair of electrical leads and a voltage dependent switch coupled to said rectifier and to the junction of said impedance and to one of said pair of electrical leads whereby energy from said ballast is selectively coupled by said impedance or said rectifier to said electrical lead having said mercury dispensing target affixed thereto in accordance with the development of a voltage across said second coil of a value less than or greater than the breakdown voltage of said voltage dependent switch.

4,494,043

IMPLODING PLASMA DEVICE

Charles H. Stallings, Pleasanton; Richard L. Schneider, Hayward, both of Calif.; Frederick K. Childers, Winchester, Mass.; Stephen M. Matthews, Oakland, Calif.; Ian S. Roth, Ithaca, N.Y.; Heikki I. Helava, and Ray M. Stringfield, Jr., both of Oakland, Calif., assignors to Physics International Company, San Leandro, Calif.

Filed Jul. 2, 1981, Ser. No. 280,066
Int. Cl.³ H01J 7/24
U.S. Cl. 315—111.41 **5 Claims**

2. An imploding plasma device comprising

an ionizable material,

an anode,

a cathode spaced apart from said anode comprising a nozzle adapted to inject said ionizable material toward said anode, said injected ionizable material defining a hollow cylindrical column,

means for generating a high voltage pulse of electrical current,

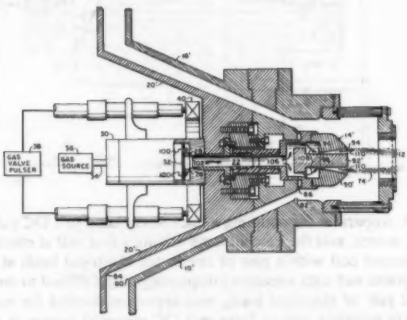
means for connecting said means for generating a high voltage pulse of electrical current to said anode and said cathode comprising

a cathode feed conductor having one end connected to said cathode and the other end connected to one side of said

means for generating a high voltage pulse of electrical current,

said cathode feed conductor comprising a generally radially planar first conductor having an outer diameter connected to one side of said means for generating a high voltage pulse and an inner diameter connected to said cathode,

an anode feed conductor having one end connected to said anode and the other end connected to the other side of said means for generating a high voltage pulse of electrical current



said anode feed conductor comprising a generally radially planar second conductor having an outer diameter connected to the other side of said means for generating a high voltage pulse of electrical current and an inner diameter connected to said anode,

said generally radially planar first conductor being spaced apart from said generally radially planar second conductor.

4,494,044

COMPUTER TYPE ELECTRONIC FLASH DEVICE

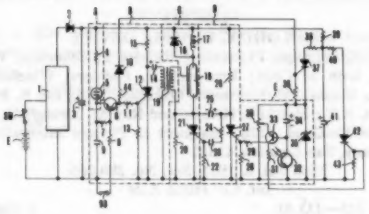
Hiroyuki Kataoka, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,231

Claims priority, application Japan, Jun. 18, 1981, 56-94443

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—151 **1 Claim**



1. A computer type electronic flash device comprising:

(a) flash illuminating means for producing light energy;

(b) light measuring means for receiving the light of the flash illuminating means as reflected by an object to be photographed, and for producing a flash terminating signal;

(c) first control means operative in response to the flash terminating signal to render said flash illuminating means inoperative;

(d) a power source having a charged capacitor, the capacitor supplying electric power to the light measuring means concurrently with the commencement of the operation of said flash illuminating means; and

(e) second control means for rendering said power source inoperative in response to said flash terminating signal, the second control means having a resistor connected in parallel to the capacitor in response to said flash terminating signal.

4,494,045

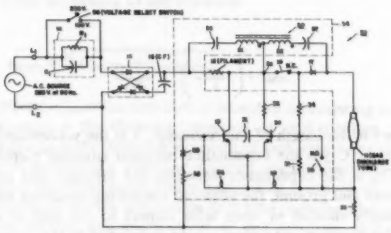
BALLAST CIRCUIT FOR A 220-VOLT IMPROVED LIGHTING UNIT

John M. Davenport, Lyndhurst, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,849

Int. Cl.³ H05B *41/16, 41/24*

U.S. Cl. 315—247 **4 Claims**



1. In a lighting unit having a gas discharge tube as the main light source, a filament as a supplementary light source and in serial arrangement with said discharge tube and a starting circuit for the gas discharge tube, a resistive ballast circuit for the gas discharge tube being adapted to accept across its first and second input terminals an applied alternating current (A.C.) voltage having a typical value of 220 volts at a frequency of 50 Hz, said ballast circuit having an output stage comprised of a parallel arrangement of a full-wave rectifier and a filter capacitor both for developing a D.C. operating voltage for the gas discharge tube, said full-wave rectifier having two input nodes one of which is connected to one of said input terminals and two output nodes connected across said output stage, said output stage being capable of accepting across its first and second output terminal said arrangement of said filament and said gas discharge tube, said ballast circuit further comprising a resistor-capacitor network at its input stage connected between one of the input terminals and the other input node of the full-wave rectifier;

said resistor-capacitor network having values selected so as to reduce the A.C. voltage by a factor in the range of about 2 to about 1 in the development of said D.C. operating voltage of said gas discharge tube.

4,494,046

SINGLE CATHODE BEAM MODE FLUORESCENT LAMP FOR DC USE

A. Bowman Budinger, Westford; Wojciech W. Byszewski, Arlington, and Joseph M. Proud, Wellesley Hills, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 337,047, Jan. 4, 1982,. This application Jan. 20, 1984, Ser. No. 572,600

Int. Cl.³ H05B *41/16, 41/24*

U.S. Cl. 315—260 **6 Claims**

1. A single electrode beam mode fluorescent lamp comprising:

a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;

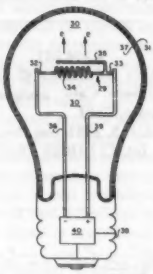
a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;

a single electrode having first and second ends located within said envelope, said electrode including a thermionic cathode and an integral anode;

means for coupling a D.C. voltage between said first and second ends of said electrode with said first end electrically positive with respect to said second end;

said thermionic cathode for emitting electrons in response to said D.C. voltage;

said integral anode for accelerating electrons and forming an electron beam, said anode including a linear conductive wire segment and being L-shaped and connected to said first end of said electrode and extending in spaced relation to said cathode;



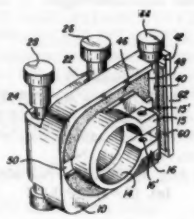
a drift region within said envelope through which said electron beam drifts after passing said anode, so that the electrons in said drift region collide with the atoms of said fill material, thereby causing excitation of a portion of said fill material atoms and emission of ultraviolet radiation and causing ionization of another portion of said fill material atoms thereby yielding secondary electrons, said secondary electrons causing emission of additional ultraviolet radiation.

4,494,047

CONVERGENCE DEVICE FOR COLOR-PRODUCING CATHODE RAY TUBE

Walter A. Schwalm, 745 Barberry La., Lake Forest, Ill. 60045

Filed Jun. 10, 1982, Ser. No. 387,174
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—368 **10 Claims**



1. A purity adjustment device for a color television tube which includes an electron beam gun for developing three electron beams disposed on the screen in linear array, which comprises:

a base member;

means for connecting said base member to the color television tube;

a manually-adjustable rod formed of magnetic material carried by said base member, said manually-adjustable rod being rotatable and including a plurality of pole pairs disposed along it;

a pair of pole pieces extending from said manually-adjustable rod and curving in a manner to provide substantially straight magnetic lines of force across said color television tube, said pole pieces each having one end which is adjacent to said manually-adjustable rod and each is adapted to extend from said one end past the neck of the color television tube and to curve toward the other pole piece but being spaced from the other pole piece; and

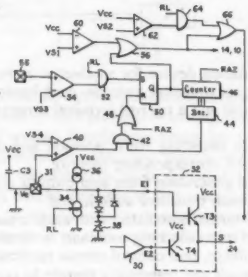
a third pole piece abutting said manually-adjustable rod and sandwiching said manually-adjustable rod between said third pole piece and said first and second pole pieces.

4,494,048

SCANNING CONTROL CIRCUIT FOR A TELEVISION RECEIVER, WITH GRADUAL STARTUP

Michel Van Den Driessche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 26, 1982, Ser. No. 444,799
Claims priority, application France, Nov. 27, 1981, 81 22271
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **5 Claims**



1. In a television receiver comprising a switched mode power supply and a scanning control circuit, said power supply circuit comprising a power switching element (T2) and a pulse-width modulator (24, 26) having an input for receiving a modulating voltage and an output for providing pulses of modulated width, wherein said scanning control circuit comprises, in view of ensuring gradual start-up of scanning:

supply terminals for receiving a low voltage supply (Vcc),

a capacitor (C3) having a first plate and a second plate which are connected to said supply terminals in such a way that upon starting up of the receiver, said first plate will follow the rising potential of one supply terminal,

a voltage limiter (38) to limit the voltage on said capacitor first plate to a predetermined value Vz,

an analogic voltage transmission device (32) having a first input connected to said capacitor first plate, a second input for receiving a control voltage which may vary between predetermined limits, and an output which is connected to the input of said pulse width modulator, said voltage transmission device being designed so that its output will transmit either the voltage on its first input or the voltage on its second input, depending on the relative magnitude of these voltages, the transmitted voltage being the one which corresponds to the narrower pulse width at the output of the pulse width modulator,

the value of Vz being such that it corresponds to a pulse width narrower than the minimum pulse width that may be produced by the modulator when said modulator receives the said control voltage from the transmission device,

means (34) for progressively altering the electrical charge of said capacitor so as to vary the potential of its first plate in a sense corresponding to an increase of the pulse width defined by this voltage.

4,494,049

COMMUTATING DEVICE FOR AN ELECTRIC MOTOR SUPPLIED FROM A D-C VOLTAGE SOURCE

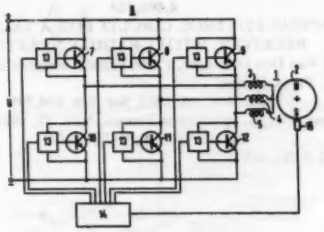
Wilhelm Leitgeb, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,907

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142142

Int. Cl.³ H02K 23/00

U.S. Cl. 318—138 1 Claim



1. A commutating device for an electric motor comprising:
(a) a plurality of transistor switches each having two switching terminals and a control terminal arranged in a bridge circuit;
(b) means for detecting rotor position and developing an output signal corresponding thereto;
(c) means for generating from said outputs signal a control signal for each transistor switch; and
(d) a control circuit associated with each transistor coupled across said two switching terminals to obtain therefrom a control voltage, said control circuit receiving one of said control signals and responsive thereto to couple said control voltage to the control terminals of said transistor, said control circuit comprising:
(i) a voltage regulator for regulating the control voltage obtained from across said terminals;
(ii) a capacitor for storing said voltage;
and
(iii) a further transistor for coupling said capacitor voltage to said control terminals in response to a control signal.

4,494,050

SYSTEM FOR SUPRESSION OF UNDERDAMPED OSCILLATIONS IN AC POWER DRAWN BY SYNCHRONOUS MOTORS DRIVING WARD-LEONARD GENERATORS

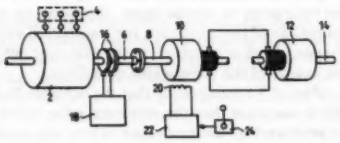
Noel R. Godfrey, Gordon; Larry S. Parkes, Engadine, and Richard H. Treacy, Wollstonecraft, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Australia

Filed Oct. 11, 1983, Ser. No. 540,617

Claims priority, application Australia, Oct. 10, 1982, PF6343/82

Int. Cl.³ H02P 5/24

U.S. Cl. 318—158 10 Claims



1. A method of reducing the amplitude of oscillations in input electrical power to a drive system, the system including a synchronous motor the output shaft of which is coupled to drive a dc generator which is in turn coupled electrically to a dc motor, the output shaft of which is coupled to a mechanical load, said generator including a generator field exciter, said method including the steps of generating a control signal for controlling said generator field exciter, at least one component of the control signal having been derived from the dc motor and related to its instantaneous power and is passed through a notch filter the frequency response of which generally provides reciprocal compensation for the frequency response of the ratio of input electrical power to the synchronous motor to the mechanical power on its output shaft, and applying the control signal to said exciter to thereby reduce oscillations in input electrical power to the synchronous motor.

4,494,051

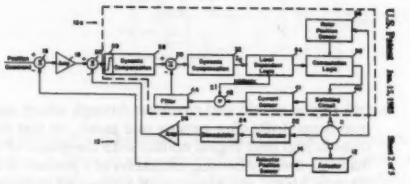
MULTI-QUADRANT BRUSHLESS DC MOTOR DRIVE

David A. Bailey, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 5, 1982, Ser. No. 354,963

Int. Cl.³ H02K 29/02

U.S. Cl. 318—254 37 Claims



1. Apparatus for controlling the current and torque of a brushless DC motor comprising:
a brushless DC motor having a plurality of windings;
a plurality of solid state power switches respectively connected to said windings for selectively applying power to develop current therein;
means for determining the states and order of switching between states of said solid state switches in response to a current error signal;
means for deriving a current feedback signal indicative of current in the motor windings; and
means for combining the current feedback signal with an applied current command signal to develop the error signal.

4,494,052

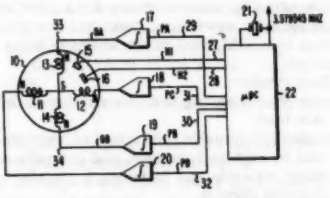
DC MOTOR SERVO SYSTEM

Kevin C. Kelleher, Palm Harbor, Fla.; Ned J. Kiser, and Todd J. Christopher, both of Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 5, 1982, Ser. No. 405,441

Int. Cl.³ H02P 5/06

U.S. Cl. 318—254 12 Claims



1. A system for controlling a brushless DC motor of the type having two or more stator coils which are successively energized to impart rotation to a rotor including a permanent

magnet having a plurality of alternating North and South poles comprising:

first and second sensor elements mounted in fixed relation to the stator coils for providing first and second bilevel signals representing the relative position of the rotor magnet poles with respect to the stator coils, said bilevel signals having a predetermined phase relationship;

a reference signal having a frequency to which the rotation rate of said rotor is to be synchronized;

control signal generating means responsive to said first and second bilevel signals for generating pulsed control signals the phases of which are determined by the state of said first and second bilevel signals and the durations of which are substantially determined by successive transitions of said bilevel signals when the system is operating in a spin up mode, and being further responsive to said reference signal for synchronizing motor speed thereto in a locked speed mode, said control signal generating means generating an error signal related to the difference between rotor frequency and said reference signal frequency by performing successive time measurements between a prescribed transition of said first bilevel signal and a prescribed transition of said reference frequency, and processing said error signal in accordance with the function

$$H(z) = \frac{(1 - AZ^{-1})(1 - BZ^{-1})}{(1 - CZ^{-1})(1 - DZ^{-1})}$$

where Z connotes the conventional Z transform and the factors A, B, C, and D are constants which are positive real or zero, the magnitude of the processed error signal determining the phase relationship of said control signals in the locked speed mode and determining the duration of said pulsed control signals by varying the leading edges thereof relative to the trailing edges of said control signals which are determined responsive to state transitions of said first and second bilevel signals in said locked speed mode; and

driver circuits responsive to said pulsed control signals for energizing respective ones of said stator coils, said driver circuits designed to provide stator coil drive current of either polarity, the duration of which is proportional to the duration of said control signals.

4,494,053

WINDING VOLTAGE BALANCING CIRCUIT FOR BRUSHLESS DC MOTOR

Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 29, 1982, Ser. No. 445,174

Claims priority, application Japan, Nov. 27, 1981, 56-191392; Nov. 27, 1981, 56-191393; Nov. 28, 1981, 56-191582; Nov. 28, 1981, 56-191583

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—254 **12 Claims**

1. A brushless DC motor comprising:

a field flux generating means having a plurality of N and S poles;

multiphase coils for generating a force by the interaction between a current flowing through said multiphase coils and fluxes of said field flux generating means;

a DC voltage source for supplying a current to said multiphase coils;

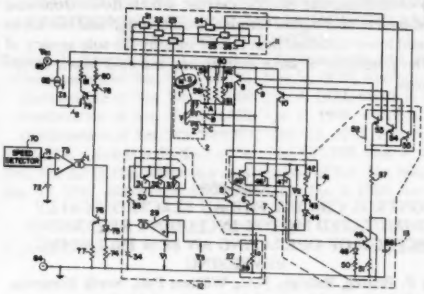
a plurality of first output transistors;

a plurality of second output transistors, each of the current-input terminals of said multiphase coils being connected to a corresponding one of said plurality of first output transistors and to a corresponding one of said plurality of second output transistors so as to supply said multiphase coils with a current by activating at least one of said first output transistors and at least one of said second output transistors at the same time;

a position detecting means for providing a set of output signals corresponding to the relative position between said filed flux generating means and said multiphase coils;

a first distributing means for selectively activating said plurality of first output transistors corresponding to the output signals of said position detecting means so as to supply said multiphase coils with a current according to a command signal; and

a second distributing means for selectively activating said



plurality of second output transistors corresponding to the output signals of said position detecting means,

wherein said second distributing means has a voltage drop controlling means for detecting voltage drops across said first output transistors in each activated period and for controlling output currents of said second output transistors so as to maintain the voltage drops across said first output transistors in each activated period at a predetermined value.

4,494,054

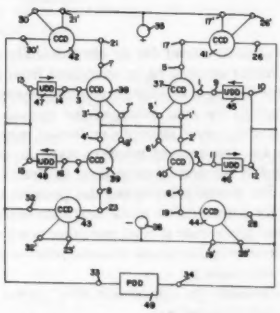
ELECTRIC POWER DELIVERY SYSTEM AND METHOD

Gerald N. Pellegrini, 7 Ventura Rd., Worcester, Mass. 01604

Filed Apr. 13, 1983, Ser. No. 484,178

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—254 **48 Claims**



1. A method for supplying and controlling the delivery of electric power to an electric power converting device, said device comprising input terminals of differing electrical potentials, and said device converting electric power to some other form of useful power through the agency of an electrical system, said system comprising an electrical apparatus and an electrical power source and sink, said method comprising the acts of;

(a) controlling the source electric current which flows from said source to a higher electrical potential input terminal, where said higher terminal is one of said input terminals,

by the sole agency of the potential of same said higher terminal,

or

(b) controlling the sink electric current which flows from a lower electrical potential input terminal to said sink, where said lower terminal is one of said input terminals, by the sole agency of the potential of same said lower terminal,

or

(c) controlling the electric current which flows from said source to said higher terminal then through said device to said lower terminal then to said sink, by the sole agency of the potentials of same said higher and said lower terminals.

4,494,055

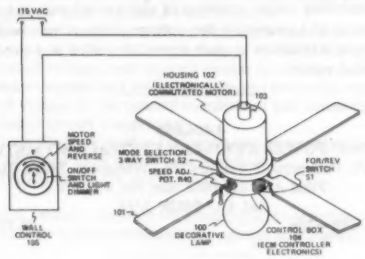
CONTROL CIRCUIT FOR AN ELECTRONICALLY COMMUTATED MOTOR INCLUDING REVERSING; METHOD OF OPERATING AN ECM INCLUDING REVERSING

Ricky F. Bitting, Raleigh, N.C.; William Pell, North Syracuse, and Thomas A. Brown, Fulton, both of N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 9, 1983, Ser. No. 502,594

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 **25 Claims**



1. In a motor control circuit for an electronically commutated reversible motor adapted to be energized from a power source, said motor having a multistage winding assembly, and a magnetic assembly, the two arranged for mutual relative rotation, said motor in a given state of a multistate energization sequence having an unenergized winding stage in which an induced back emf is integrated over time to determine the instant at which the mutual relative angular position has been attained suitable for commutation to the next state of sequence, and wherein in said given state at least one other winding stage is energized in the appropriate sense to cause relative rotation, the combination comprising

power input terminals for connection to a power supply suitable for motor operation;

first adjustable voltage reduction means for serially connecting a motor via said input terminals to the power supply to provide a variable output voltage suitable for variable speed or torque operation;

means for producing a substantially smooth control voltage dependent on said variable output voltage, said control voltage, upon passing through an intermediate value corresponding to a useful limit of said adjustable means, continuing monotonically toward a final value, and

means responsive to a value of said control voltage between said intermediate and final values for generating a signal for changing the direction of motor rotation.

4,494,056

MOTOR DRIVING CIRCUIT

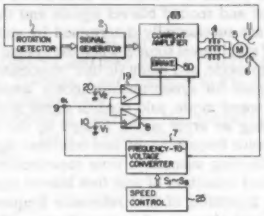
Hideo Nishijima; Katsumi Sera; Isao Fukushima, and Yasunori Kobori, all of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,372

Claims priority, application Japan, Mar. 31, 1982, 57-51345

Int. Cl.³ H02P *3/20*

U.S. Cl. 318—269 **12 Claims**



1. A motor driving circuit with a decelerating function comprising:

a group of motor driving coils;

position detecting means for detecting the rotational position of a motor;

signal generating means responsive to an output of said position detecting means for generating a motor driving signal;

motor driving means for changing over a first and a second group of switching elements provided between said group of motor driving coils and a first electric source potential and between said group of motor driving coils and a second electric source potential, respectively, so as to supply said group of motor driving coils with a current in alternating directions;

speed control means responsive to a speed setting command for providing a speed control signal; and

braking control means responsive to said speed control signal for making conductive all the switching elements of selected one of said first and second groups so as to short-circuit said group of motor driving coils.

4,494,057

SPEED CONTROL SYSTEM FOR SMALL MEDICAL MOTORS

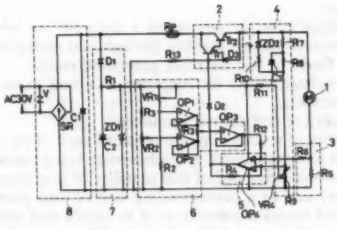
Toshihiro Hotta, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Dec. 2, 1982, Ser. No. 446,318

Claims priority, application Japan, Dec. 5, 1981, 56-181421[U]

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—317 **6 Claims**



1. A speed control system for a small medical motor used for

dental handpieces and medical apparatuses which is responsive to an applied motor drive voltage and current from a direct current power supply, comprising:

a drive voltage regulator circuit connected in series with said motor;

a current detection circuit for generating a current detection signal in accordance with motor current;

a voltage detection circuit for generating a voltage detection signal in accordance with the motor voltage coupled in parallel to said motor and which comprises:

a dividing means for dividing a portion of the drive voltage;

a speed-up limiting circuit having a gradually increasing speed-load characteristic connected in series with said dividing means and comprising:

a zener diode;

at least two division resistors connected in parallel to said zenor diode; and

a capacitor connected in parallel to one of said division resistors; and

a speed control circuit which controls the drive voltage regulation circuit in accordance with the voltage and current detection signals of both detection circuits, said speed control circuit having positive and negative feedback inputs with said voltage detection signal coupled to said negative feedback input and said current detection signal coupled to said positive feedback input;

whereby the current detection signal of said current detection circuit is positive-fedback and the voltage detection signal of said voltage detection circuit is negative-fedback to said speed control circuit to keep motor speed at a gradually increasing speed-load characteristic set by said speed-up limiting circuit.

4,494,058

MOTOR CONTROL FOR DATA DISC ROTATING SYSTEMS

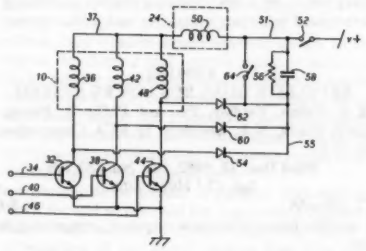
Eugenio Berti, San Jose, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1982, Ser. No. 451,669

Claims priority, application United Kingdom, Dec. 31, 1981, 8139206

Int. Cl.³ H02K *7/102*

U.S. Cl. 318—372 **12 Claims**



1. An apparatus for rotating an informational data storage disc in a disc data store wherein a motor has a plurality of stator windings, each having a first end coupled to a common point, in turn coupled to a power supply point via a choke and each having a second end selectably couplable to a power supply return through a corresponding plurality of selectably operable stator switches, said apparatus comprising:

energy absorbing circuit means, coupled intermediately between said second ends of said windings and said power supply point, for absorbing inductive recoil energy from said windings; and

ganged double switch means, including a first section operable when said double switch means is in a first position for coupling said power supply point to a power supply rail for the operation of said motor and a second section operable when said double switch means is in a second position for shunting said energy absorbing circuit means to thereby pass dynamo currents, generated in said windings in consequence of the rotation of said motor, through said choke to act as a brake upon the rotation of said motor.

4,494,059

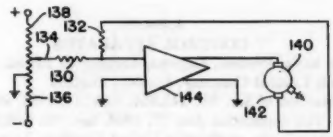
STRUCTURE FOR AND METHOD OF SURFACE CONDITIONING SENSING AND INDICATING AND MOTOR SPEED CONTROL

Robert W. Kearns, 9725 Lookout Pl., Gaithersburg, Md. 20760

Continuation of Ser. No. 957,775, Nov. 6, 1978, which is a continuation of Ser. No. 814,000, Jul. 8, 1977, which is a continuation of Ser. No. 565,478, Apr. 7, 1975, which is a continuation of Ser. No. 340,557, Mar. 12, 1973, Pat. No. 3,876,919, which is a division of Ser. No. 487,795, Jun. 8, 1970, Pat. No. 3,721,115, which is a continuation of Ser. No. 666,703, Sep. 11, 1967, abandoned. This application Jan. 9, 1980, Ser. No. 110,714

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 **12 Claims**



1. A motor-signal generator system comprising a direct current motor including a commutator and having three brushes contacting the commutator, an energy source, a first electrically conductive circuit means connected to two of said three brushes for energizing said motor-signal generator and a second electrically conductive circuit means connected to the third and one other of said three brushes for deriving a signal generated within the motor-signal generator when the motor is rotationally displaced, said signal having an alternating current component, said second electrically conductive circuit means including means for obtaining the alternating current component of said signal.

4,494,060

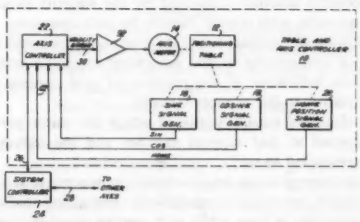
AXIS CONTROLLER FOR ROBOTIC ACTUATOR

Anwar Chitayat, Northport; Robert C. Goldstein, Patchogue, and Mustansir A. Faizullabhoy, Stony Brook, all of N.Y., assignors to Anorad Corporation, Hauppauge, N.Y.

Filed Mar. 2, 1983, Ser. No. 471,237

Int. Cl.³ G05B *19/42*

U.S. Cl. 318—568 **18 Claims**



1. A position processor for a robotic controller of the type employing first and second sensed position signals having a phase relationship, said phase relationship containing informa-

tion about a position of an object within a cycle of position, said object being movable over a plurality of cycles of position, comprising:

means for comparing phases of said first and second sensed position signals to produce a reported position within a cycle of position;

means for producing a predicted position of said object including full cycles of position and a position within a cycle of position;

means for differencing said predicted position within a cycle of position and said reported position to produce a position error signal; and

means responsive to said position error signal for accumulating a smoothed position signal representing said position of said object.

4,494,061

CONTROL APPARATUS

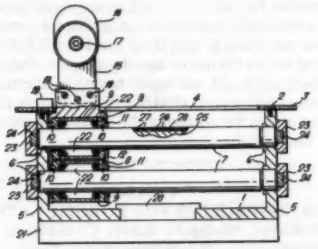
Arthur Kaye, Preston, England, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 242,564, Mar. 11, 1981, abandoned. This application Jun. 27, 1984, Ser. No. 625,187

Claims priority, application United Kingdom, Mar. 15, 1980, 8008846; Sep. 26, 1980, 8031102

Int. Cl.³ G05B *11/01*

U.S. Cl. 318—628 **13 Claims**



1. A control device for enabling an operator to control associated apparatus to which, in use, the control device is connected, the control device comprising:

a fixed support member;

a control member supported by the support member and movable with respect thereto by said operator;

output means connected to the control member and operable for transmitting to said associated apparatus control signals indicative of the position of said control member relative to the support member;

an electrical stepper motor of which the stator part is connected to said support member and the mover part is connected to said control member; and

motor energization means which is connected to said stepper motor and which is operable for energizing said motor to generate, at least while said control member is at one or more discrete positions in its range of movement relative to the support member, an attractive force between the stator and mover parts of the motor tending to resist manual movement of the control member.

4,494,062

CIRCUIT ASSEMBLY FOR CHARGING AN ACCUMULATION BATTERY WITH PULSATING DIRECT CURRENT

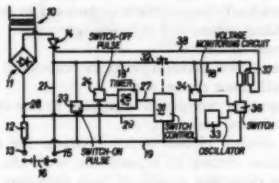
Kurt Hirri, Oberkulm, Switzerland, assignor to Gebrüder Zehnder A.G., Gränichen, Switzerland

Filed Jun. 4, 1982, Ser. No. 384,948

Claims priority, application Switzerland, Jun. 17, 1981, 3976/81

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—40 **3 Claims**



1. A device for charging an accumulator type battery comprising:

a current source for providing a charging current;

terminal means for connecting said device to said battery;

a controllable current valve means connected between said current source and said battery for controlling said charging current to said battery;

a series resistor connected to said current source for providing a reference voltage proportional to said charging current;

a control pulse generating means connected to said terminal means and said controllable current valve means for generating control pulses to said controllable valve means in relationship to the voltage of said battery;

electrically actuated switch means connected to said control pulse generating means for electrically connecting and disconnecting said control pulse generating means and said controllable current valve means; and

energizing means connected to said electrically actuated switch means including presettable timer means for supplying a deenergizing signal to said electrically actuated switch at a preset time after a predetermined delay, said delay resets upon said charging current generating a predetermined reference voltage in said series resistor.

4,494,063

SATELLITE DUAL BUS POWER SYSTEM

Patrick J. Callen, Yardley, Pa., and Philip R. Pierce, Point Pleasant Beach, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,773

Int. Cl.³ H02J *7/00*

U.S. Cl. 320—56 **5 Claims**

4. A satellite power distribution system, comprising, in combination:

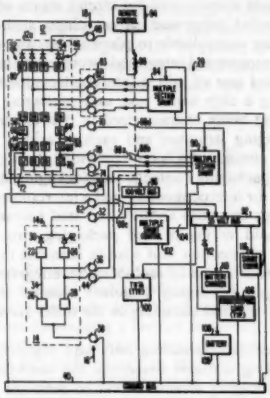
first and second means, each for producing electrical energy of first and second higher and lower values respectively in response to the application of solar energy thereto, which solar energy is not always present;

first and second power distribution means including separate first and second power distribution busses coupled respectively to said first and second means for producing electrical energy;

means for selectively coupling said first electrical energy producing means to said second power distribution means, said second power distribution means, when so coupled receiving electrical energy from said first electrical energy producing means; and

electrical energy storage means coupled to said second power distribution bus for receiving, when said solar

energy is present, electrical energy from said second electrical energy producing means, and, when coupled to said first electrical energy producing means, for receiving



energy from said first electrical energy producing means and for providing power to only said second distribution bus when said solar energy is not present.

4,494,064

DIRECT CURRENT INRUSH LIMITING CIRCUIT

John C. Harkness, 2006 Wellesley, St. Paul, Minn. 55105, assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,550

Int. Cl.³ G05F *1/44*

U.S. Cl. 323—277 **8 Claims**

1. A circuit for controlling the inrush of direct current from a supply voltage upon connection to an uncharged capacitive load, said circuit comprising:

series current regulating means for, responsively to a control signal, regulating the direct current flow from said supply voltage to said capacitive load;

series current sensing means at the connection of said supply voltage to said capacitive load for developing a sense signal proportional to the direct current flow from said supply voltage to said capacitive load;

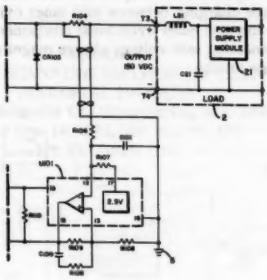
feedback loop control means for, resonsively to said sense signal, developing said control signal so as to cause said series current regulating means to cyclically oscillate from conduction to non-conduction of said direct current flow until such time as said capacitive load is substantially fully charged whereupon said control signal is developed so as to cause said series current regulating means to conduct a normal, quiescent, current flow;

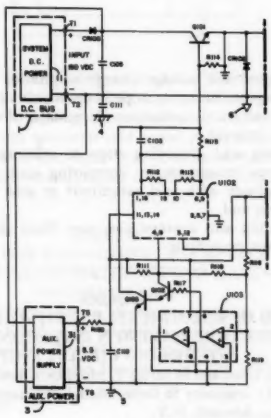
freewheeling diode means, in parallel with said capacitive load, for and so oriented for, conducting current into said load when said series current regulating means are non-conducting of said direct current flow from said supply voltage to said capacitive load while not conducting any appreciable current when said normal, quiescent, current flow is obtained;

means for ensuring that when the circuit is supplied with insufficient voltage for reliable correct operation then said series current regulating means will be maintained non-conductive of said direct current flow from said supply voltage to said capacitive load; and

wherein said capacitive load is possessed of at least such small series inductance as will preclude that direct current conducted by said series current regulating means from said supply voltage to said capacitive load should increase so essentially instantaneously that said feedback loop control means responsive to said series current sensing means should not have sufficient time to respond for control of said series current regulating means, and such as will ensure that some current should flow to said load through said freewheeling diode means when said series current regulating means are non-conducting;

whereby said direct current from said voltage supply to said capacitive load does flow alternately through said series





current regulating means and said freewheeling diode means in charging said capacitive load;

whereby said direct current inrush upon connection of a supply voltage to an uncharged capacitive load is limited;

whereby if said circuit is unpowered or underpowered its operation is to isolate said capacitive load from said supply voltage.

4,494,065

ELECTRIC CAPACITY MEASUREMENT OF ERRATICALLY SHORTED CAPACITORS

Harvey S. Benson, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Nov. 8, 1982, Ser. No. 440,007

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **15 Claims**

11. A method for determining the average clearance between concentric cylindrical components having an inner cylindrical component and an outer cylindrical component includes the steps of:

placing said inner cylindrical component into said outer cylindrical component, said inner and outer cylindrical components having a close contiguous relationship;

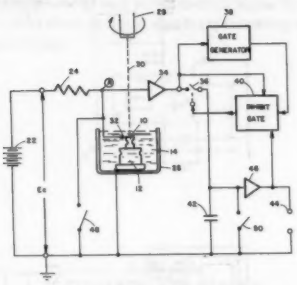
inserting between said inner cylindrical component and said

outer cylindrical component a dielectric fluid of known permittivity;

applying a known current between said inner cylindrical component and said outer cylindrical component;

moving said inner cylindrical component with respect to said outer cylindrical component to permit intermittent interruption of electrical contact between said inner and outer cylindrical components and thereby permitting voltage charging between said inner cylindrical component and said outer cylindrical component;

communicating said voltage charge magnitude to a voltage storage means;



storing of said voltage charge magnitude in said voltage storage means being stopped upon either (1) reestablishing said electrical contact, or (2) passage of a predetermined time interval;

repeating said preceding steps to achieve a peak charge voltage magnitude by comparing each voltage charge magnitude with said magnitude in said voltage storage means; and

calculating said average clearance from said peak charge voltage magnitude.

4,494,066

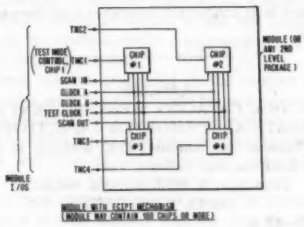
METHOD OF ELECTRICALLY TESTING A PACKAGING STRUCTURE HAVING N INTERCONNECTED INTEGRATED CIRCUIT CHIPS

Prabhakar Goel, and Maurice T. McMahon, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 280,050, Jul. 2, 1981, Pat. No. 4,441,075. This application Jul. 29, 1983, Ser. No. 518,580

Int. Cl.³ G01R *31/28;* G06F *11/00*

U.S. Cl. 324—73 R **2 Claims**



1. A method for performing an electrical test of a packaging structure containing n interconnected integrated circuit chips, said method being accomplished while said n interconnected chips remain interconnected and without the use of a mechanical probe structure, each of said n integrated circuit chips including test circuit means, said test circuit means including scan-in scan-out circuit means, said scan-in scan-out circuit means of each of said n interconnected integrated circuit chips including shift register latch circuit means, said test circuit means of each of said n integrated circuit chips further including control circuit means, said control circuit means cooperating with said scan-in scan-out circuit means of each of said n interconnected integrated circuit chips, said control circuit means being controllable to place all but any selected one of said n interconnected integrated circuit chips in a "test" mode, said selected one of said n interconnected integrated circuit chips being a chip under test, said packaging structures and said method being characterized in that electrical contact to said packaging structure and each of said n interconnected integrated circuit chips is only provided through a plurality of accessible packaging contacts, said packaging structure including wiring for interconnecting said n interconnected integrated circuit chips one with another and said accessible packaging contacts, said wiring of said packaging structure including wiring for connecting said scan-in scan-out circuit means of said test circuit means of each of said n integrated circuit chips into a single packaging structure scan-in scan-out circuit means, said method including in the order recited the following steps:

(a) electrically contacting only said plurality of accessible packaging contacts determine the electrical integrity of the packaging structure scan-in scan-out circuit means wherein the term electrical integrity is defined as determining whether or not said packaging structure scan-in scan-out circuit means is electrically defective;

(b) electrically contacting only said plurality of accessible packaging contacts determine the electrical integrity of said packaging structure wiring wherein the term electrical integrity is defined as determining whether or not said packaging structure wiring is electrically defective; and

(c) electrically contacting only said plurality of accessible packaging contacts determine the electrical integrity of any selected one of said n interconnected integrated circuit chips, wherein step (c) of said method includes the following sub-steps in the order recited,

(1) placing a binary value in said packaging structure scan-in scan-out circuit means,

(2) placing each chip of said n interconnected integrated circuit chips, except said any selected one of said n integrated circuit chips, in a "test mode", whereby said selected one of said n inteconnected integrated cuircut chips is a "chip under test (CUT)",

(3) employing at least the binary value placed in said packaging structure scan-in scan-out circuit means impress a bianry value on the integrated circuit chip under test, and

(4) employing at least the packaging structure scan-in scan-out circuit means obtain and examine a binary output from said chip under test to determine the electrical integrity of said chip under test, wherein the term electrical integrity is defined as determining whether or not said integrated circuit chip under test is electrically defective.

4,494,067

FAST FREQUENCY MEASURING SYSTEM

Andrzej Barszczewski, Gloucester, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Sep. 28, 1982, Ser. No. 425,919

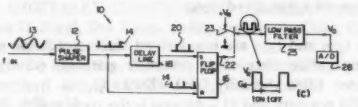
Claims priority, application Canada, Jan. 18, 1982, 394,358

Int. Cl.³ G01R *23/14*

U.S. Cl. 324—79 D **10 Claims**

1. A frequency measuring system comprising a frequency counter for producing a coarse digital reading of an input signal frequency, means for producing a digital vernier reading of said input signal frequency, and means for combining the coarse reading and vernier reading to produce a final frequency reading, said means for producing a digital vernier reading comprising a frequency to voltage converter having an input terminal for receiving said input signal frequency, and

means for converting said input signal to first and second trains of pulses, said second train of pulses being delayed with respect to said first train of pulses, said first and second trains of pulses being applied to first and second inputs of a phase detector, said phase detector having an output voltage proportional to the phase difference between said first and second trains of pulses and varying with changes in the frequency of the input signal, said system further comprising analog means for producing a time average of said output voltage and an analog to



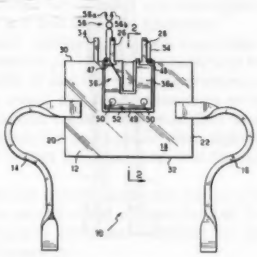
digital converter for converting said time average of said output voltage to a digital reading, wherein said converter has an output which repeats every ΔF of the frequency of the input signal, said system comprising a further frequency to voltage converter for producing a second output displaced by a constant fraction of ΔF with respect to the output of the first converter, and means for switching from one output to the other to avoid discontinuities occurring every ΔF in each output.

4,494,068

MEASUREMENT SHUNT WITH COMPENSATION FOR INDUCED ERROR VOLTAGES

Antony Ley, Bievres; Roland Allesch, Antony, and Alain Bazin, Villejuif, all of France, assignors to Enertec, Montrouge, France

Continuation of Ser. No. 207,822, Nov. 17, 1980, abandoned. This application Apr. 27, 1983, Ser. No. 488,522
Claims priority, application France, Nov. 28, 1979, 79 29222
Int. Cl.³ G01R *1/20*; H01C *5/00*
U.S. Cl. 324—126 **11 Claims**



1. A measurement shunt comprising:

a resistance formed from a plate of electrically conductive material, first and second current terminals and voltage terminal means connected to the plate, the voltage terminal means being disposed on a common edge of the plate at spaced apart points thereon, the resistance proving at the voltage terminal means a voltage representative of an electric current applied to the shunt at said current terminals and passing through the resistance; and

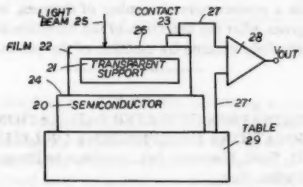
inductor means for developing a stray variable magnetic field induced voltage that is equal in magnitude and opposite in polarity to any stray variable magnetic field induced error voltage in said plate, the inductor means being formed from an electrically conductive material and having first and second ends disposed in the vicinity of the voltage terminal means, the inductor means extending from its first and second ends towards the interior of the surface of the plate in a plane substantially parallel to and adjacent the plate, electrical insulation means between said inductor means and said plate, the inductor means being connected electrically in series with a path in the plate via the voltage terminal means and between first and second measurement terminals, the inductor means providing, in the presence of a variable magnetic field, a voltage free of induced error voltage at the measurement terminals.

4,494,069

OPTICAL SCANNING METHOD OF TESTING MATERIAL DEFECTS

Hung C. Lin, 8 Schindler Ct., Silver Spring, Md. 20903

Filed Sep. 14, 1981, Ser. No. 302,150
Int. Cl.³ G01R *1/06*
U.S. Cl. 324—158 R **11 Claims**



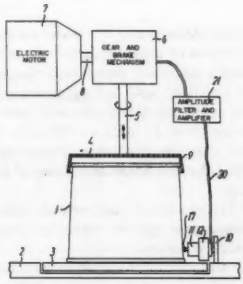
1. A method of detecting defects in a material comprising the steps of placing an at least partially transparent probe on said material, said probe forming a potential barrier with said material, scanning a light spot over said probe, producing a photovoltaic effect where said light spot is incident, sensing said photovoltaic effect corresponding to said light spot position.

4,494,070

APPARATUS FOR POSITIONING RECEPTACLES OF FERROMAGNETIC MATERIAL AND HAVING A WELDING SEAM

Pierre-René Peronard, Virum, Denmark, assignor to Dansk Svejsemaskine Fabrik A/S, Denmark

Filed Jan. 7, 1982, Ser. No. 337,949
Claims priority, application Denmark, Jan. 20, 1981, 249/81
Int. Cl.³ G01B *7/14*
U.S. Cl. 324—208 **1 Claim**



1. An apparatus for positioning receptacles having a substantially cylindrical side wall of ferromagnetic material and a longitudinal welding seam in a predetermined angular position, which apparatus comprises:

(a) means for rotating the receptacle about the cylinder axis thereof;

(b) first means for detecting the welding seam, the first means including a magnetic probe having a tip of ferro-

magnetic material, a housing, the tip of the probe projecting from the housing, and a permanent magnet disposed in the housing for producing a magnetic field extending outside the probe between the tip and the housing;

(c) means for mounting the probe, the mounting means including spring means for elastically urging the probe towards the cylindrical receptacle wall so as to bring the tip into engagement therewith and for movement in a direction towards and away from the cylindrical wall of the receptacle, and permitting ejection of the probe outwardly from the wall when the tip engages the welding seam to create an air gap of sufficient duration for producing a variation in the strength in the field exceeding a predetermined threshold value;

(d) second means for detecting the variation in the strength of the field created by ejection of the probe; and

(e) means for stopping the rotational movement of the receptacle a predetermined number of degrees, including zero degrees, after the detection of the variation in the strength of the field created by ejection of the probe.

4,494,071

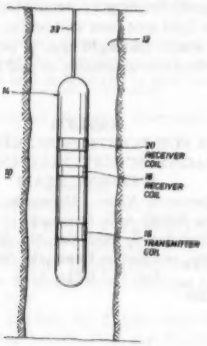
DETERMINATION OF WATER SATURATION IN EARTH FORMATIONS INDEPENDENT OF LITHOLOGY

Walter H. Fertl, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 20, 1982, Ser. No. 340,911

Int. Cl.³ G01V *3/12, 3/30;* E21G *49/00*

U.S. Cl. 324—338 **1 Claim**



1. A method for determining the water saturation of subsurface earth formation of complex lithology substantially independent of salinity contrasts, comprising the steps of:

traversing a borehole with a logging instrument having a transmitter injecting electromagnetic energy in the frequency range from 10 mHz to 200 mHz into the formations and first and second longitudinally spaced receivers for detecting the amplitude and phase of said electromagnetic energy;

generating a first electrical measurement functionally related to the propagation time of said electromagnetic energy through said formations;

injecting into said formations an aqueous solution containing a surface active agent to displace substantially all the residual fluids in said formations surrounding said borehole, wherein said surface active agent is selected from the group consisting of ampolytie, cationic and nonionic;

injecting into said formations water to displace said aqueous solution in a sufficient amount and to render said formations surrounding said borehole substantially water saturated;

traversing said borehole with said logging instrument and generating a second electrical measurement functionally related to the propagation time of said electromagnetic energy through said water saturated formations;

said first measurement determined in accordance with the relationship

$$t_{EP1}=\phi S_w t_{EPW}+\phi(1-S_w)t_{EPHC}+(1-\phi)t_{EPM}$$

and said second measurement determined in accordance with the relationship

$$t_{EP2}=\phi T_{EPW}+(1-\phi)t_{EPM};$$

were t_{EP1} and t_{EP2} are log-derived electromagnetic energy propagation time, ϕ is reservoir porisity, ϕSwt_{EPW} is water filled porosity, $\phi(1-Sw)t_{EPHC}$ is hydrocarbon filled porosity and $(1-\phi)t_{EPM}$ is the rock matrix; and

combining said first and said second electrical measurements to determine the water saturation of said formations substantially independent of salinity contrasts.

4,494,072

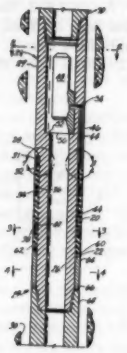
WELL LOGGING APPARATUS WITH REPLACEABLE SENSOR CARRYING INSULATING SLEEVE DISPOSED IN ROTATION RESTRAINED POSITION AROUND A DRILL STRING

John D. Jeter, Iowa Park, Tex., and Henry S. More, Carmichael, Calif., assignors to Exploration Logging, Inc., Sacramento, Calif.

Division of Ser. No. 141,769, Apr. 21, 1980, Pat. No. 4,356,629. This application Aug. 23, 1982, Ser. No. 410,374

Int. Cl.³ G01V *3/18;* E21B *49/00, 17/02*

U.S. Cl. 324—347 **15 Claims**



1. Well logging apparatus comprising:

an elongated housing having a longitudinal opening extending through it;

means at each end of the housing for securing it in a drill string in a well;

a replaceable insulating sleeve having a longitudinal opening through it disposed around the housing;

longitudinally extending mating grooves and splines on the sleeve and housing for preventing rotation of the sleeve relative to the housing and permitting the sleeve to slide longitudinally relative to the housing when the sleeve is replaced;

means on the housing at one end of the sleeve and engaging the said one end of the sleeve and housing to prevent the sleeve from sliding longitudinally relative to the housing in one direction;

removable means at the other end of the sleeve disposed and arranged to hold the sleeve in compression to make a snug fit of the sleeve on the housing and prevent the sleeve

from sliding longitudinally relative to the housing while the apparatus is in the well,

the grooves and splines on the sleeve and housing tapering inwardly toward the removable means to provide a close slip-fit of the sleeve on the housing; and

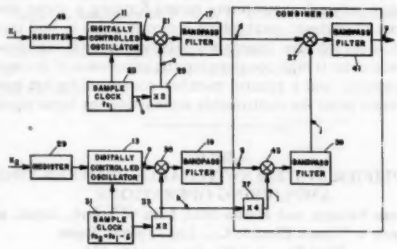
sensing means on the sleeve for measuring a characteristic of formations penetrated by the well.

4,494,073

FREQUENCY GENERATOR USING COMPOSITE DIGITALLY CONTROLLED OSCILLATORS

Aladino D. Sorgi, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Sep. 27, 1982, Ser. No. 423,605
Int. Cl.³ H03K 3/80; H03B 21/02
U.S. Cl. 328—14 7 Claims



1. A frequency generator capable of producing a large number of evenly spaced frequencies over a wide band, comprising:

a first digitally controlled oscillator that oscillates at a first frequency;

first register means for applying a digital input to said first digitally controlled oscillator;

first clock means for sampling said first digitally controlled oscillator at a first sampling frequency;

first frequency multiplying means connected to said first clock means for providing a first multiplied frequency that is a multiple of said first sampling frequency;

first mixing means electrically connected to said first digitally controlled oscillator and said first frequency multiplying means for mixing said first digitally controlled oscillator output frequency and said first multiplied frequency;

first filter means electrically connected to said first mixing means for passing a first selected band of frequencies;

a second digitally controlled oscillator for oscillating at a second frequency;

second register means for applying a digital input to said second digitally controlled oscillator;

second clock means for sampling said second digitally controlled oscillator at a second sampling frequency that is different than said first sampling frequency;

second frequency multiplying means for providing a second multiplied frequency that is a multiple of said second sampling frequency;

second mixing means electrically connected to said second digitally controlled oscillator and said second frequency multiplying means for mixing said second digitally controlled oscillator output frequency and said second multiplied frequency;

second filter means electrically connected to said second mixing means for passing a second selected band of frequencies; and

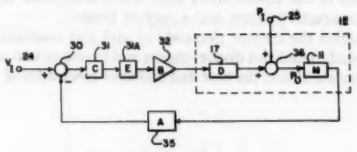
combiner means for combining said first selected band of frequencies and said second selected band of frequencies and producing through output filter means any one of a large band of closely and evenly spaced frequencies in accordance with the selection at the first and second register means.

4,494,074

FEEDBACK CONTROL

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Apr. 28, 1982, Ser. No. 372,472
Int. Cl.³ H03F 1/32
U.S. Cl. 330—109 7 Claims



1. In a feedback control system for providing a controlled output signal in response to an input control signal having components including amplifying means having an input and output for amplifying a signal applied to said input and arranged in a closed loop with feedback means for coupling said output to said input and the amplifying means characterized by open loop gain and phase margin between said input and output when the feedback path therebetween is interrupted, the improvement comprising,

means for establishing the open loop gain of said amplifying means substantially uniform at a significant level over a predetermined frequency range bounded substantially at at least one end by a break frequency,

said amplifying means including means for establishing the change in said open loop gain as a function of frequency outside said predetermined frequency range in a region from said break frequency to a critical frequency where said open loop gain is substantially unity with magnitude of slope of said open loop gain greater than 6 decibels per octave for a significant portion of said region while maintaining the phase margin in said region sufficient to ensure stability,

thereby providing high gain over said predetermined frequency range while avoiding oscillation and minimizing the error between said controlled output signal and a desired controlled output signal designated by said input control signal.

4,494,075

VOLUME CONTROL CIRCUIT

Kozo Yoshihisa, and Isamu Okui, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,340
Claims priority, application Japan, Jan. 28, 1981, 56-12076
Int. Cl.³ H03G 3/30; H03F 3/45
U.S. Cl. 330—254 10 Claims

1. A volume control circuit having a pair of reference potential lines, an input terminal and an output terminal, said volume control circuit comprising:

(a) input means coupled to said input terminal for converting an input signal applied to said input terminal to 1st and 2nd currents, said 1st current containing a 1st signal component and said 2nd current containing a 2nd signal component whose phase has an antiphase relation with the phase of said 1st signal component;

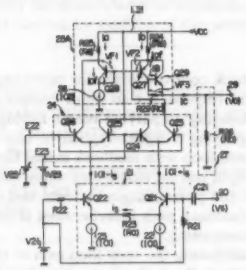
(b) 1st divider means coupled to said input means and responsive to a volume control signal, for current-dividing said 1st current and providing a 1st divided current, the current division ratio of said 1st divider means being

changed with the magnitude of said volume control signal;

(c) 2nd divider means coupled to said input means and responsive to said volume control signal, for current-dividing said 2nd current and providing a 2nd divided current, the current division ratio of said 2nd divider means being changed with the magnitude of said volume control signal;

(d) circuit means coupled to said 1st and 2nd divider means for providing an output current corresponding to said 1st and 2nd divided currents, said circuit means including 1st and 2nd transistors of 1st conductivity type, a 3rd transistor of 2nd conductivity type which is opposed to said 1st conductivity type, and a current feeder;

wherein the emitter electrode of said 2nd transistor is coupled to said 2nd divider means and to one of said reference potential line, the base and collector electrodes of said 2nd



transistor are coupled through said current feeder to the other of said reference potential lines, the base electrode of said 1st transistor is coupled to the base electrode of said 2nd transistor, the emitter electrode of said 1st transistor is coupled to said 1st divider means and to said one of reference potential line, the collector electrode of said 1st transistor is coupled to the base electrode of said 3rd transistor, the collector electrode of said 3rd transistor is coupled to the emitter electrode of said 1st transistor, the emitter electrode of said 3rd transistor provides said output current;

and wherein said 1st and 2nd transistors form a current mirror, and said 1st and 3rd transistors form an inverted Darlington; and

(e) output means coupled to said circuit means and to said output terminal, for converting said output current to an output signal which is obtained from said output terminal.

4,494,076

SIGNAL INPUT CIRCUIT WITH CONTROLLED INPUT SIGNAL ATTENUATION

Heinz Rinderle, Heilbronn, Fed. Rep. of Germany, assignor to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 478,523

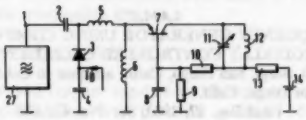
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1982, 3210453

Int. Cl.³ H03G *3/18*

U.S. Cl. 330—284 **29 Claims**

1. A signal input circuit comprising an input terminal for connection to an input signal source to receive an alternating current input signal, a control member for the controllable attenuation of the input signal and firmly set reactances for the selection of the input signal, wherein said reactances are connected and dimensioned to constitute means for establishing a circuit point in said circuit at which said circuit has a large impedance compared to the impedance of the signal source, and said control member is connected to said means to act upon this circuit point.

29. A signal input circuit comprising: an input terminal connectable to a source of an alternating current input signal; an amplifier component for amplifying the input signal; a circuit impedance reference point, a reactance network comprising fixed value reactances connected between said input termi-



nal and said amplifier component for conducting the input signal from said terminal to said amplifier component, said reactance network constituting means forming a series resonant circuit unit and establishing a circuit point in said input circuit at which the impedance relative to said impedance reference point is high compared to the impedance of the input signal source; and a control member connected to act upon said circuit point for controllably attenuating the input signal.

4,494,077

AMPLIFIER SYSTEM SWITCHABLE BETWEEN TWO AMPLIFYING OPERATIONS

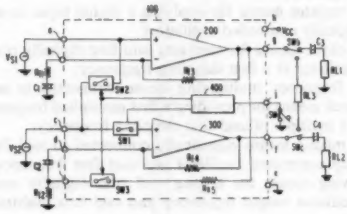
Hirokazu Fukaya, and Haruo Niki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,131

Claims priority, application Japan, Dec. 2, 1981, 56-194151; Mar. 8, 1982, 57-36140

Int. Cl.³ H03F *3/68*

U.S. Cl. 330—295 **23 Claims**



1. An amplifier comprising:

first and second input terminals;

first and second output terminals;

a first amplifying circuit having a non-inverting input and an output;

first means for coupling said first input terminal to said non-inverting input of said first amplifying circuit;

second means for coupling the output of said first amplifying circuit to said first output terminal;

a second amplifying circuit having a non-inverting input, an inverting input and an output;

first switch-means for selectively coupling said second input terminal to either one of said first means and said non-inverting input of said second amplifying circuit;

third means for coupling the output of said second amplifying circuit to said second output terminal;

second switch means for selectively connecting said second means to said inverting input of said second amplifying circuit;

a switch controlling circuit controlling said first and second switch means between a first state in which said second input terminal and said second means are coupled respectively to said first means and said inverting input of said

second amplifying circuit and a second state in which said first switch means couples said second input terminal to said non-inverting input of said second amplifying circuit and said second switch means disconnects said second means from said inverting input of said second amplifying circuit;

first and second loads;

a third load having first and second ends; and

third switch means for selectively connecting said first output terminal and said second output terminal to said first load and said second load, respectively, or to said first and second ends of said third load, respectively.

4,494,078

CLASS BC POWER AMPLIFIER

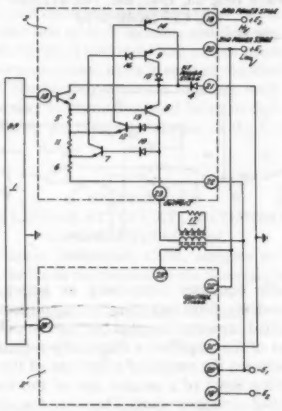
Vassil B. Vassilev, and Vassil M. Soflyanski, both of Sofia, Bulgaria, assignors to V M E I "Lenin", Sofia, Bulgaria

Filed Apr. 29, 1981, Ser. No. 258,808

Claims priority, application Bulgaria, Apr. 29, 1980, 47571

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—297 **18 Claims**



1. A class BC power amplifier having a symmetrical push-pull preamplifier and a pair of symmetrical branches coupled, respectively, to the outputs of said push-pull preamplifier, each of said branches including a first power stage, operating in class B, coupled to the output of said branch, a control stage coupled to the respective output of said push-pull preamplifier for controlling said first power stage, a second power stage, operating in class C, coupled to said first power stage, and a first comparative stage coupled between said control stage and said branch output for controlling said second power stage, characterized in that each branch branch of said power amplifier further comprises a third power stage, operating in class C, also coupled to said first power stage, and a second comparative stage coupled between said control stage and said branch output for controlling said third power stage; a low voltage supply source and high voltage supply source, each of said supply sources having a grounded center point and a positive and a negative pole, the positive pole of said low voltage supply source being coupled to said second power stage of one of said branches and to the control stage of the other of said branches, the negative pole of said low voltage supply source being coupled, conversely, to the control stage of said one branch and to the second power stage of said other branch, and the positive and negative poles of said high voltage supply source being coupled respectively, to the third power stages of said one and said other branches.

4,494,079

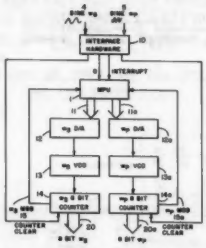
MICROPROCESSOR CONTROLLED PHASE LOCKED LOOPS

David O. Light, Jr.; Frank Hayes, III, both of Huntsville, and Joseph R. McGinty, Madison, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1981, Ser. No. 328,892

Int. Cl.³ H03K *7/00, 5/26*

U.S. Cl. 331—1 A **5 Claims**



1. In a control system in which a digital counter is phase-locked to a reference frequency, an improvement comprising a processing unit connected to said digital counter for controlling the rate at which said counter counts; said reference frequency being divided into cycles and connected to said processing unit such that said processing unit can sense the start of a cycle, the half cycle point and the end of a cycle of said reference frequency; the most significant bit output of said counter being connected to said processing unit; said processing unit causing said counter to clear at the end of each cycle; and said processing unit sensing the output of said most significant bit at the half cycle point, and causing said counter to increase its rate of count if the output of the most significant bit is digital zero and causing said counter to decrease its rate of count if the most significant bit is a digital one.

4,494,080

VOLTAGE-CONTROLLED OSCILLATOR WITH INDEPENDENT GAIN AND FREQUENCY CONTROLS

Mark G. Call, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,508

Int. Cl.³ H03K *3/03;* H03J *7/04;* H03K *3/282*

U.S. Cl. 331—8 **5 Claims**

1. An improved phase-locked loop comprising:

comparator means for comparing a first and a second signal, wherein said first signal is a signal for establishing a phase standard, for generating an error signal indicative of any phase difference between said first and second signals;

filter means having an input coupled to receive the error signal from said comparator means for generating a first control signal;

a first circuit means for generating a second control signal, said first circuit means including:

(a) a supply voltage source having first and second terminals;

(b) a current mirror circuit means coupled to one of said voltage source terminals and having an output for supplying said second control signal; and

(c) a resistor coupling the input of said current mirror circuit means to the other of said voltage source terminals;

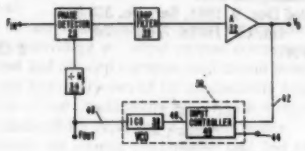
an oscillator for producing an output signal with a frequency and gain determined by an input signal thereto;

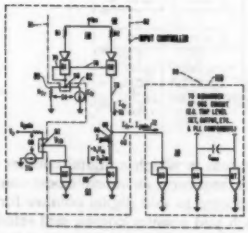
means for deriving said second signal for said comparator means from said oscillator output signal;

a second circuit means responsive to said first control signal

from said filter means for selectively producing a third control signal for controlling the gain of said oscillator;

means combining said second and third control signals into a summing/difference signal; and





means for deriving the input signal to said oscillator from said summing/difference signal whereby said phase-locked loop has its free-run frequency set by the first circuit means and the gain set by the second circuit means.

4,494,081

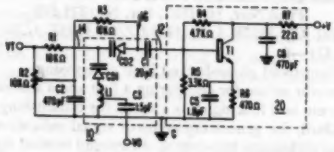
VARIABLE FREQUENCY U. H. F. LOCAL OSCILLATOR FOR A TELEVISION RECEIVER

Jeffrey G. Lea, Noblesville, and David J. Carlson, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,735

Int. Cl.³ H03L 7/00; H03B 5/18

U.S. Cl. 331—36 C **9 Claims**



1. An oscillator including amplifying means for exhibiting gain of at least unity including means for providing regenerative feedback to make said amplifying means oscillate, and a resonant circuit coupled to said amplifying means to control the frequency at which said amplifying means oscillates, wherein said resonant circuit is responsive to a control potential to control said frequency, said resonant circuit comprising:

first and second capacitance means having respective pairs of first and second electrodes between which respective capacitances are exhibited, said first electrodes of said pairs of electrodes being of the same type and said second electrodes of said pairs of electrodes being of the same type, the value of said capacitances being controllable responsive to respective potentials developed across said capacitance means, said first and second capacitance means being connected in series with their respective first electrodes connected together;

an inductance to which said first and second capacitance means are connected to form a tuned circuit; and

means for developing said potentials across said capacitance means including means for applying said control potential to said first electrodes of each of said first and second capacitance means so as to change the capacitances thereof in the same sense with respect to each other in response to changes of said control signal; and adjustable means connected to said second electrode of said second capacitance means for causing the potential at said second electrode of said second capacitance means to differ from the potential at said second electrode of said first capacitance means by an adjustable amount to cause said potential developed across said first capacitance means to differ in predetermined relationship from said potential developed across said second capacitance means.

4,494,082

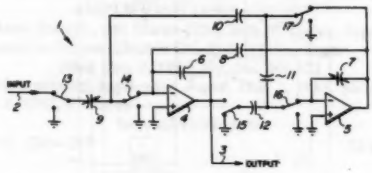
SWITCHED-CAPACITOR VARIABLE EQUALIZER

Jeffrey H. Bennett, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 25, 1982, Ser. No. 411,416

Int. Cl.³ H04B 3/14

U.S. Cl. 333—28 R **10 Claims**



1. A variable equalizer comprising an active switched-capacitor biquadratic filter including two amplifiers each having an unswitched capacitor coupled between an output and an inverting input of the amplifier, a diagonally-switched capacitor coupled between the output of a first one of the amplifiers and the inverting input of a second one of the amplifiers, a through-switched capacitor coupled between the output of the second amplifier and the inverting input of the first amplifier, switched-capacitor means coupled between an input of the equalizer and the inverting input of at least one of the amplifiers, means for varying the capacitance of the unswitched capacitor coupled between the output and the inverting input of one of the amplifiers thereby to vary the equalizer characteristics, and means for deriving an output of the equalizer from the output of the other of the amplifiers.

4,494,083

IMPEDANCE MATCHING STRIPLINE TRANSITION FOR MICROWAVE SIGNALS

Lars G. Josefsson, Askim; Bengt T. Svensson, Mölndal, and Lars F. Moeschlin, Frölunda, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 4, 1982, Ser. No. 384,976

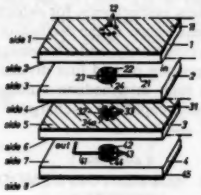
Claims priority, application Sweden, Jun. 30, 1981, 8104097

Int. Cl.³ H01P 5/00

U.S. Cl. 333—33 **4 Claims**

1. An impedance matching coaxial transition for microwave signals comprising first and second laminates, at least one intermediate laminate between the first and second laminates, an input conductor from a stripline circuit on the first laminate, an output conductor to a stripline circuit on the second laminate, each of said laminates having a conducting region on one side thereof, a center through-plated hole in each of said first and intermediate laminates, a conducting collar for each hole

on each laminate on at least one side of the respective laminate, a plurality of further through plated holes in each of said laminates, the further through-plated holes in the first and intermediate laminates respectively surrounding said center holes therein, each of said further holes being in conducting connection with another hole in said plurality of holes by a first conducting region on one side of the respective laminate and by a second conducting region on the other side of said laminate, said collar and said second conducting region defining a slightly elevated area on the respective side of each laminate,



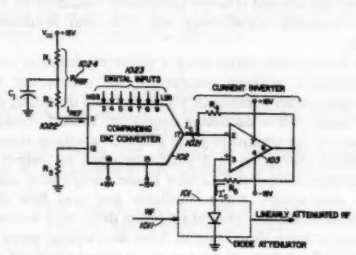
said center through-plated hole in said first laminate forming a first conducting structure together with the corresponding center hole in said intermediate laminate and said elevated area of the respective side of each laminate and defining a conducting connection between said input and output conductors, said plurality of through-plated holes in each of the laminates forming a second conducting structure together with the corresponding plurality of through-plated holes in the other laminates and defining the return conductor of the coaxial transition.

4,494,084

PIN DIODE LINEAR ATTENUATOR CONTROLLED BY A COMPANDING DAC

Richard S. Hughes, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1982, Ser. No. 353,752
Int. Cl.³ H03H *11/24*
U.S. Cl. 333—81 R **1 Claim**



1. A digitally controlled linear radio frequency attenuator, comprising:

a companding digital to analog converter having a digital input and an approximated exponential analog current sink output;

a current inverter having an input effectively coupled to said exponential analog current sink output, and having an output which provides an output control current which is the inverse of the current appearing at the inverter input; and

a PIN diode having a radio frequency input, a linearly attenuated radio frequency output, a control current input and a logarithmic radio frequency attenuation characteristic for use as a radio frequency attenuator, effectively coupled to said current inverter output;

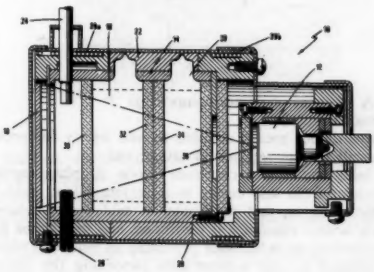
whereby a digital input signal to the companding digital to analog converter provides an approximated exponential current sink output which is inverted by the current inverter and provided to the PIN diode to control the logarithmic radio frequency attenuation characteristic to thereby linearly attenuate a radio frequency signal applied to the radio frequency input in response to the digital input to the companding digital to analog converter.

4,494,085

MINIATURIZED ATOMIC FREQUENCY STANDARD HAVING BOTH FILTER CELL AND ABSORPTION CELL IN RESONATOR CAVITY

Seymour Goldberg, Boston, Mass., assignor to EG&G, Inc., Wellesley, Mass.

Filed Apr. 28, 1982, Ser. No. 372,834
Int. Cl.³ H03L *7/26*
U.S. Cl. 331—94.1 **13 Claims**



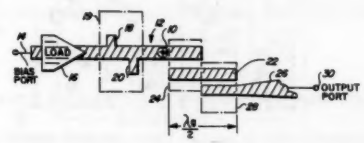
1. In an optical-physics package for use with an atomic frequency standard including a light source, a microwave cavity, and an absorption cell positioned within said cavity to be irradiated by said light source, the improvement comprising a filter cell also positioned within said microwave cavity between said absorption cell and said light source.

4,494,086

TRANSMISSION LINE OSCILLATOR HAVING INDEPENDENTLY ADJUSTABLE Q AND INPUT RESISTANCE

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1982, Ser. No. 403,760
Int. Cl.³ H03B *5/18, 7/12, 9/14;* **H01P** *7/08*
U.S. Cl. 331—96 **17 Claims**



1. A transmission line microwave oscillator having two degrees of freedom and including an active device for producing microwave oscillations, an input impedence as seen by the active device having a real portion, Rin, and the oscillator having an external quality factor, Q_{EXT}, the oscillator comprising:

resonant means electromagnetically coupled to the active device such that Rin is adjustable by changing the electromagnetic coupling between the active device and said resonant means; and

an output transmission line electromagnetically coupled to said resonant means such that the Q_{EXT} is adjustable by

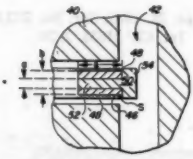
changing the electromagnetic coupling between said output transmission line and said resonant means.

4,494,087

COMBINER PROBE PROVIDING POWER FLATNESS AND WIDE LOCKING BANDWIDTH

Michael Dydyk, Scottsdale; Norman K. Enlow, Mesa, and Joseph R. Tuzzolino, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1982, Ser. No. 414,231
Int. Cl.³ H03B 5/18; H01P 7/06
U.S. Cl. 331—107 DP **9 Claims**



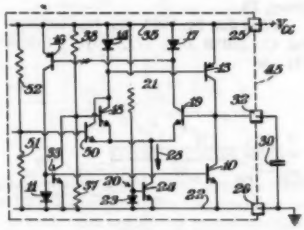
7. A resonant combiner comprising:
a resonant cavity;
active device means coupled to said cavity for providing oscillatory power in said cavity; and
at least one power combiner probe coupling oscillatory power from said cavity to an external load, said probe including an end positioned in said cavity whereby a capacitive reactance is produced, and said probe further including an inductance providing an inductive reactance coupled to and substantially cancelling the capacitive reactance.

4,494,088

OSCILLATOR WITH CAPACITOR CHARGED AND DISCHARGED BY CURRENT PROPORTIONAL TO A REFERENCE CURRENT

Walter S. Gontowski, Jr., Thompson, Conn., and George E. Rollins, Holden, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 26, 1982, Ser. No. 401,505
Int. Cl.³ H03K 3/282, 4/52
U.S. Cl. 331—111 **2 Claims**



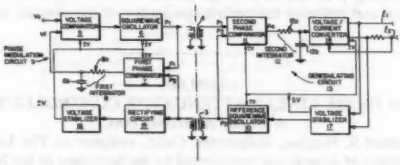
1. A stable silicon integrated oscillator circuit for connection to a discrete capacitor comprising:
a pair of DC power supply busses;
a charger current-mirror circuit having an output branch connected in a series circuit with said capacitor which series circuit is connected between said pair of DC supply busses;
a discharger current-mirror circuit having an output branch connected in parallel with said capacitor;
a current source for producing a reference current; and
a switching circuit portion comprising a pair of differentially-connnected transistors, said current source being connected between one of said power supply busses and the emitters of said differentially-connected transistors, the input branches of said charger and discharger current mirror circuits being respectively connected in the collector circuits of one and another of said pair of differentially-connected transistors; yet another transistor being parallel connected, collector-to-collector and emitter-to-emitter, with said one transistor; first and second resistive voltage dividers connected across said pair of DC busses having high and low intermediate voltage points, respectively, being connected to the bases of said one and yet another transistors, respectively, for determining the high peak and low peak values of the oscillating voltage across said capacitor, respectively; and a transistor switch means for shunting a portion of said first divider to reduce the voltage at said high intermediate voltage point during intervals when said capacitor discharges.

4,494,089

PULSE PHASE MODULATOR/DEMODULATOR SYSTEM

Taizo Yagi, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Mar. 15, 1982, Ser. No. 358,607
Claims priority, application Japan, Apr. 22, 1981, 56-61681
Int. Cl.³ H03K 7/04, 9/04
U.S. Cl. 332—14 **4 Claims**



1. A two-wire type converter, comprising a first system located nearby a detecting element and electrically insulated from a second system located far from said detecting element, said first and second systems electrically insulated by means of a first insulated transformer and a second insulated transformer;
said first system comprising a phase modulation circuit including a voltage comparator for comparing a signal voltage with a feedback voltage of said detecting element; a square wave oscillator connected to said voltage comparator for controlling the phase of a square wave signal output therefrom in dependence upon an output of said voltage comparator; a first phase comparator connected to said square wave oscillator and said first insulated transformer for detecting a phase difference between said square wave signal output from said square wave oscillator and a reference square wave signal obtained through said first insulated transformer; a first integrator circuit connected to said first phase comparator for integrating an output from said first phase comparator and generating said feedback voltage fed to said voltage comparator;
said second system comprising a demodulation circuit including a reference square wave oscillator connected to said first insulated transformer for generating said reference square wave signal; a second phase comparator for detecting a phase difference between said reference square wave signal output from said reference square wave signal oscillator and said square wave signal output from said square wave oscillator obtained through said second insulated transformer; a second integrator circuit connected to said second phase comparator for integrating an output from said second phase comparator and a voltage/current converter connected to said second integrator for con-

verting a voltage signal output from said second integrator circuit to a current signal which is output to a two-wire type transmission channel.

4,494,090

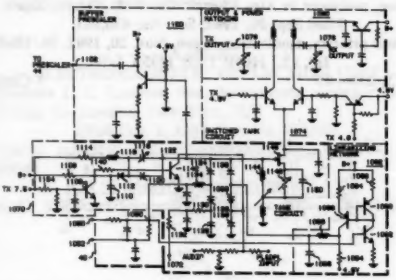
FREQUENCY MODULATION SYSTEM FOR A FREQUENCY SYNTHESIZER

Marc H. Popek, Tamarac, and Jose I. Suarez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 251,645, Apr. 6, 1981, abandoned. This application May 25, 1984, Ser. No. 614,692

Int. Cl.³ H03C *3/08, 3/09*

U.S. Cl. 332—16 T **9 Claims**



1. A frequency modulator including a voltage controlled oscillator which includes a main varactor diode coupled to a frequency resonating circuit to produce an output frequency in response to a control voltage, comprising:

a secondary varactor diode of an appreciably lower voltage to frequency sensitivity ratio than said main varactor diode coupled to said main varactor diode;

modulation input means coupled to said secondary varactor diode to enable modulation of the resonating output frequency; and

linearizing means coupled to said second varactor diode tracking the main varactor diode capacitance to provide constant carrier modulation deviation.

4,494,091

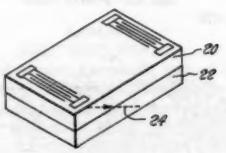
DAMPING PACKAGE FOR SURFACE ACOUSTIC WAVE DEVICES

Jeffrey H. Goll, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1983, Ser. No. 492,517

Int. Cl.³ H03H *9/25, 9/42, 9/64*

U.S. Cl. 333—151 **8 Claims**



1. A SAW device having one surface along which acoustic waves are intended to travel and a second surface opposite to said one surface;

a backing layer on said second surface;

said backing layer having substantially the same acoustic impedance as the crystal substrate of said SAW device for a family of bulk modes, and

being fabricated of an acoustically lossy material.

4,494,092

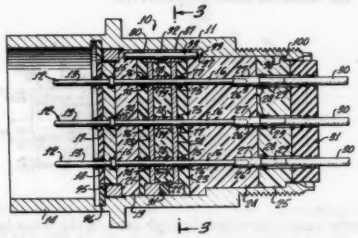
FILTER PIN ELECTRICAL CONNECTOR

Alan L. Griffin, Redlands, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Jul. 12, 1982, Ser. No. 397,603

Int. Cl.³ H03H *7/01;* **H01R** *13/66, 23/22*

U.S. Cl. 333—182 **20 Claims**



1. A filter pin electrical connector device comprising

at least one electrical contact,

an electrically conductive shell,

insert means holding said contact in said shell, and capacitor means,

said capacitor means including two disc means in axially spaced relationship with each other and transverse with respect to and having openings receiving said contact,

each of said disc means including a body of a dielectric material and first and second laminae of electrically conductive material positioned in a spaced relationship with each other in said dielectric material,

said laminae being transverse with respect to said electrical contact,

said first laminae extending to a position adjacent said opening and being electrically connected to said contact for receiving an undesired signal therefrom, said second laminae extending to adjacent the periphery of said disc means and being electrically connected to said shell for conducting a signal to said shell,

a ring of electrically conductive material around each of said discs,

each of said rings having a shoulder, each of said discs abutting one of said shoulders for thereby positioning said discs relative to said shell,

means electrically connecting said second laminae to said rings, and means electrically connecting said rings to said shell.

4,494,093

LOCKABLE TUNING MECHANISM WITH REDUCED BACKLASH

David D. Owlett, Belmont, Calif., assignor to GTE Communications Systems Corporation, Phoenix, Ariz.

Filed Nov. 1, 1982, Ser. No. 437,935

Int. Cl.³ H01P *7/04, 7/06, 1/28*

U.S. Cl. 333—232 **12 Claims**

1. Apparatus comprising:

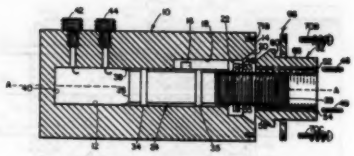
an enclosure supporting electro-magnetic waves and having an opening in one wall thereof;

a tuning probe having its circumference threaded over at least a portion of the length thereof, said probe extending through said opening in said wall and into the interior of said enclosure;

a lock ring having a threaded bore extending therethrough, being threaded onto said probe, and having at least a pair

of holes therein with axes at least generally parallel to the axis of the bore therein;

a tuning knob having a threaded bore extending therethrough, and being threaded onto said probe so as to establish a predetermined spacing between said knob and ring; said knob also having at least a pair of holes therein with axes that are generally parallel to the axis of the bore therein and located in the same orientation as associated holes in said ring so that they may be axially aligned; said holes extending all the way through one of and only part way through the other of said knob and ring; the holes in the one and other of said knob and ring also being threaded and having a diameter that is greater than that of the threaded holes, respectively;



screw means threaded through each of the holes in said one of and extending into the associated blind hole of said other of said knob and ring;

means for securely-rotatably mounting said knob on said enclosure wall for preventing axial movement of said knob; and

means for preventing rotation of said probe in said enclosure;

rotation of said knob and ring providing axial movement of said probe in said enclosure to a desired position; threading said screw means into the blind holes in the other of said knob and ring for causing the ends of said screw means to firmly contact the bottoms of the blind holes binding the threads on said probe, knob and ring for preventing further rotation of the knob and further axial movement of said probe.

4,494,094

HIGH FREQUENCY WAVEGUIDE

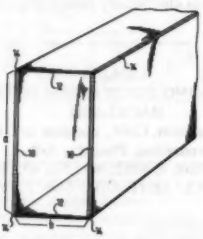
Georg Spinner, Feldkirchen-Westerham, and Franz X. Pitschi, Rottach-Egern, both of Fed. Rep. of Germany, assignors to Spinner GmbH Elektrotechnishe Fabrik, Fed. Rep. of Germany

Filed Nov. 3, 1982, Ser. No. 438,940

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143773

Int. Cl.³ H01P *3/12*

U.S. Cl. 333—239 **3 Claims**



1. A high frequency waveguide comprising a tube of rectangular cross-section having a first pair of plates parallel to each other and forming a first pair of opposite walls; a second pair of plates parallel to each other and forming a second pair of opposite walls of said rectangular tube;

the plates of said first pair of opposite walls being of the same thickness with respect to each other and the plates of said second pair of opposite walls being of the same thickness with respect to each other;

the second pair of opposite walls being transversely smaller in the cross-sectional dimension of said rectangular tube than the first pair of opposite walls;

the plates forming said second pair of opposite walls being of the order of half the thickness of the plates forming the first pair of opposite walls.

4,494,095

HIGH FREQUENCY CIRCUIT SHIELDING STRUCTURE HAVING TUNING COILS DOUBLE SHIELDED

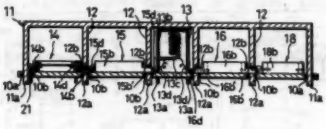
Tasuku Noji, Soma, and Torao Hiyama, Haramachi, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,981

Claims priority, application Japan, Nov. 20, 1981, 56/186422

Int. Cl.³ H04B *1/08;* H05K *5/04*

U.S. Cl. 334—85 **7 Claims**



1. An assembly structure for a high frequency circuit apparatus including:

at least one first high frequency circuit block;

a metallic chassis on which said first high frequency circuit block is disposed;

a second high frequency circuit block formed by placing a high frequency circuit element inside a metallic case having one of its surfaces opened;

means formed integrally with said first high frequency circuit block for connecting it electrically with another high frequency circuit block; and

a shield case having one of its surfaces opened and divided into compartments by shield plates shielding said high frequency circuit blocks from one another;

said second high frequency circuit block being fitted to said metallic chassis in such a fashion that the open surface thereof is sealed by said metallic chassis;

said shield case being fitted to said metallic chassis in such a fashion that said compartments thereof separate said high frequency circuit blocks from one another.

4,494,096

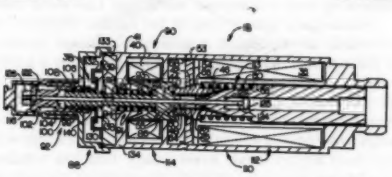
LATCHING SOLENOID

Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 9, 1984, Ser. No. 608,597

Int. Cl.³ H01H *9/20*

U.S. Cl. 335—170 **15 Claims**



1. A latching solenoid, comprising:

a body having first and second end portions and a bore extending therethrough, said bore having first and second

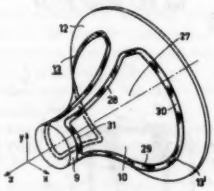
portions adjacent said first and second end portions, respectively;
a member having a bifurcated end portion and being moveable within said bore between a first position, at which said bifurcated end portion is adjacent said first portion of said bore, and a second position, at which said bifurcated end portion is adjacent said second portion of said bore;
a plunger having a first end portion and being moveable between a first position at which said first end portion is in contact with one of said first portion of said bore and said bifurcated end portion of said member, and a second position, at which said first end portion of said plunger is spaced from said bore and said member;
first means for controllably moving said plunger between said first and second positions; and
second means for controllably moving said member between said first and second positions.

4,494,097

ELECTROMAGNETIC DEFLECTION UNIT

Wilhelmus L. L. Lenders, Son, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,956
Claims priority, application Netherlands, Feb. 14, 1983, 8300543
Int. Cl.³ H01F 5/02
U.S. Cl. 335—213 **15 Claims**



1. An electromagnetic deflection unit for a television display tube comprising a first deflection coil of the saddle type and a second deflection coil disposed coaxially with respect to the first, each coil comprising two diametrically opposed coil units, wherein the first deflection coil is wound against a surface of a first hollow moulding, which surface has a compound curvature such that it is concave in a first direction and convex in a direction transverse to the first direction, and which surface is provided with a layer of contact adhesive, each coil unit of the first deflection coil comprising a number of turns of wire which are laid around each other in a single layer or a plurality of superimposed layers on said surface of the first moulding, the wire having a coating of contact adhesive and the turns of said single layer being fixed throughout their length to the layer of contact adhesive on said surface, or the turns of the layer which is adjacent said surface being fixed throughout their length to the layer of contact adhesive on said surface and the turns of each further layer being fixed to the turns of the preceding layer.

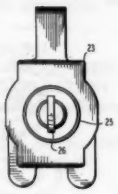
4,494,098

SOLENOID DEVICE

Hideo Haneda, and Minoru Yamanaka, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Filed Jan. 6, 1984, Ser. No. 568,567
Claims priority, application Japan, Jan. 7, 1983, 58-1000
Int. Cl.³ H01F 7/08
U.S. Cl. 335—230 **11 Claims**

1. A solenoid device comprising:
a shaft,
a permanent magnet,
two magnetic cores disposed on the sides of the north and south poles, respectively, of the permanent magnent, the permanent magnet being sandwiched between the cores such that these constitute a magnetic plunger fixed to the shaft,
two field coils for producing magnetic flux along the shaft,
a magnetic yoke body for forming a magnetic flux path along the outsides of the coils,
a magnetic center plate disposed between the coils and having an annular magnetic flux path portion through which the magnetic plunger extends, the center plate further having flange portions that constitute magnetic flux paths between the annular magnetic flux path portion and the yoke body, and
two magnetic yoke end plates each of which is coupled to



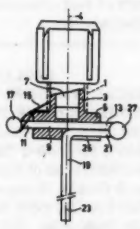
the yoke body and has an annular wall protruding into respective one of the coils in such a way that the end surfaces of the end plates are opposed to the end surfaces of the annular magnetic flux path portions,
the width A of the annular magnetic flux path portion in the direction of the axis of the shaft, the distance B between the end surfaces of the magnetic flux path portion and the respective end surfaces of the yoke end plates, the thickness C of the permanent magnet in the direction of polarization, and the length D of the magnetic cores in the direction of the axis of the shaft satisfying the following relations:
$A > C$ and $D \geqq B$.

4,494,099

HIGH-FREQUENCY COIL STRUCTURE

Pieter R. Prijs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,955
Claims priority, application Netherlands, Feb. 11, 1983, 8300513
Int. Cl.³ H01F 5/00
U.S. Cl. 335—299 **5 Claims**



1. A high-frequency coil comprising a coil winding (1) which is provided on a coil form (3) whose axis (4) extends perpendicularly to a base (5) which comprises wire-shaped connection contacts (9) which extend perpendicularly to the axis and which are embedded in the material of the base so that both their ends (11, 13) project from the base, at least one lead (15) of the coil winding being connected to the first end (11), while the second end (13) serves to establish electrical contact with the coil, said coil comprising connection pins (19), each of which comprises a first end portion (21) which extends parallel

to the second end (13) of one of the connection contacts (9) and which is electrically connected thereto, and also comprises a second end portion (23) which extends perpendicularly to the first end portion and parallel to the axis (4) of the coil form (3).

4,494,100

PLANAR INDUCTORS

Robert E. Stengel, Pompano Beach, and Charles W. Nejdl, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 12, 1982, Ser. No. 397,298
Int. Cl.³ H01F 5/00
U.S. Cl. 336—200 **8 Claims**

1. An inductor comprising:
a generally flat substrate of electrically insulating material;
a first substantially flat spiral coil disposed on one side of said substrate and having an inner end and an outer end;
trimmable shorting means, disposed on said one side of said substrate, for electrically shorting portions of said first coil to facilitate adjustment of said inductor by selectively trimming said shorting means;
a second substantially flat spiral coil disposed on the opposite side of said substrate and having an inner and an outer end;
said inner ends of said first and second coils being joined through said substrate forming a continuous coil with said first coil spiraling in and said second coil spiraling out;
said first and second coils being spiraled in the same direction as viewed from the outer end of each coil when each coil is viewed individually with said substrate oriented to position the viewed coil on the viewed side of said substrate so that an additive mutual inductive effect is achieved between said first and second coils resulting in an inductance greater than that of the sum of the inductance of the first and second coils; and
said outer ends of said continuous coil providing terminals for the inductor.

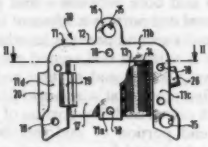
4,494,101

ELECTRICAL WINDING ON FIXED-MOUNT LAMINATED IRON CORE SUBJECT TO SHAKING

Emil Buchschmid, Roustal; Friedrich Horn, Lichtenau; Bruno Nieberl, Zirndorf; Hans-Jörg Schmidt, Feucht, and Manfred Weyerich, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,253
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 8208150[U]
Int. Cl.³ H01F 27/26
U.S. Cl. 336—210 **16 Claims**

1. Electrical winding for a magneto comprising a core of stacked sheet iron laminations, having a yoke and a plurality of legs and mounted on a base by fastening means passing through mounting holes, and a cup casing for the winding slipped onto a leg of said core, in which casing said winding is embedded,
said laminations respectively having interfitting deformations of at least one set of identically shaped deformations by which they are force-fitted together face-to-face,
one of said core legs being free of mounting holes and encompassing at least one said set of lamination deformations, and



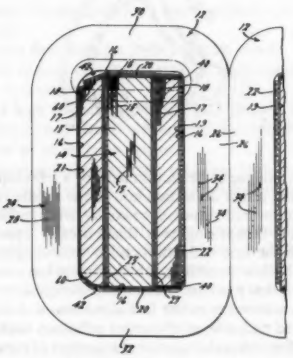
said cup casing having outward protuberations grasping said core leg which is free of mounting holes, on opposite sides thereof, so as to prevent spreading apart of said laminations in the neighborhood of said protuberations.

4,494,102

TRANSFORMER CORE AND METHOD AND APPARATUS FOR FORMING SAME

John L. Fisher, and Joe E. Curtis, Jr., both of Lexington, Ky., assignors to Kuhlman Corporation, Troy, Mich.

Filed Aug. 31, 1982, Ser. No. 413,288
Int. Cl.³ H01F 27/24
U.S. Cl. 336—212 **26 Claims**



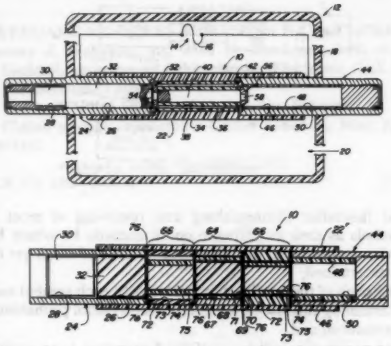
1. In an electrical transformer having electrical conductor windings and a magnetic core, said magnetic core having a pair of spaced-apart yoke portions and a pair of spaced-apart leg portions, said yoke portions and said leg portions having inner surfaces defining a window opening for receiving at least a portion of said windings extending therethrough, a first of said leg portions forming a pair of first arcuate window opening corners at its intersections with said spaced-apart yoke portions, a second of said leg portions forming a pair of second arcuate window opening corners at its intersections with said spaced-apart yoke portions, extensions of the inner surfaces of said first leg portion and said yoke portions defining a pair of first excluded areas with said first arcuate window opening corners with said first excluded areas being generally adjacent opposite ends of the inner surface of said first leg portion, and extensions of the inner surfaces of said second leg portion defining a pair of second excluded areas with said second arcuate window opening corners with said second excluded areas being generally adjacent opposite ends of the inner surface of said second leg portion, the improvement wherein at least one of said first excluded areas is greater than at least one of said second excluded areas.

4,494,103

HIGH-SPEED, MULTI-BREAK ELECTRICAL SWITCH

John M. Jarosz, Skokie, and William R. Panas, Glenview, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Continuation of Ser. No. 179,367, Aug. 18, 1980, abandoned.
This application Nov. 9, 1983, Ser. No. 550,201
Int. Cl.³ H01H 33/06
U.S. Cl. 337—282 26 Claims



1. An electrical switch for opening a current path which includes the switch, the switch comprising:

a series of alternating first and second switch cells, wherein each first switch cell comprises

a first conductive body having a first insulated bore therethrough, and

a first insulative body normally conformally located in the first bore and conformally movable therethrough; and

each second switch cell comprises

a second insulative body having a second bore therethrough, the first and second bores having substantially the same cross-section, and

a second conductive body having an insulative layer thereon and being normally conformally located in the second bore and conformally movable therethrough;

means for mounting the alternating series of cells end-to-end so that the first and second bores align;

severable metallic means for electrically interconnecting the second conductive body of each second cell to the first conductive body of each first cell adjacent thereto; and

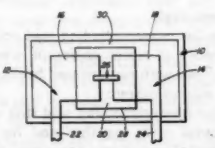
means for conjointly moving the first insulative bodies and the second conductive bodies to simultaenously sever the severable means, arcing between the first and second conductive bodies being constricted between either the first and second insulative bodies or the insulated bore and the insulative layer.

4,494,104

THERMAL FUSE

Edward S. B. Holmes, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 18, 1983, Ser. No. 514,444
Int. Cl.³ H01H 37/76, 85/04
U.S. Cl. 337—403 11 Claims



1. A fuse comprising:

(i) a substrate;

(ii) a pair of electrodes disposed upon the substrate and spaced apart to define a gap between them;

(iii) a fuse link extending across said gap in intimate relationship with the substrate and interconnecting said electrodes electrically;

(iv) a film of solder intimately overlying said fuse link and at least part of at least one of said electrodes, the solder, when molten, being capable of dissolving said fuse link;

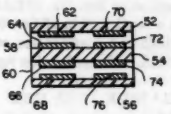
the arrangement being such that when its melting point is exceeded the solder will melt, dissolve the fuse link and retreat from the gap thereby severing the electrical connection between the electrodes.

4,494,105

TOUCH-CONTROLLED CIRCUIT APPARATUS FOR VOLTAGE SELECTION

V. Dean House, Orem, Utah, assignor to Spectra-Symbol Corporation, Salt Lake City, Utah

Filed Mar. 26, 1982, Ser. No. 362,475
Int. Cl.³ H01C 10/10
U.S. Cl. 338—114 49 Claims



1. A pressure contact control apparatus comprising:

a first member having a first elongated electrically resistive surface on at least a part of a first side thereof;

a second member having a first elongated electrically conductive surface on a first side thereof;

at least one further surface on said first side of said first member having predetermined electrical conductivity characteristics, said further surface being spaced apart from said first resistive surface;

means for supporting the first and second members such that the first conductive surface is presented in closely spaced proximity with respect to both said first resistive surface and said further surface; and

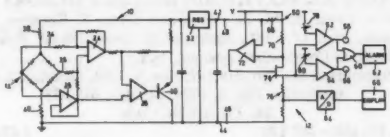
wherein one of the first and second members is sufficiently flexible to permit electrical contact between a selected one of (a) the first conductive surface and the first resistive surface and (b) the first conductive surface and said further surface in response to application of localized pressure to at least one of the first and second members.

4,494,106

PRESSURE MONITOR

Guy L. B. Smith, Transvaal; Derik Howard, Johannesburg, and Anton B. Goedhals, Transvaal, all of South Africa, assignors to Grathnail Development Company Limited, Jersey, Channel Islands

Filed Feb. 18, 1982, Ser. No. 349,757
Claims priority, application South Africa, Feb. 18, 1981, 81/1063
Int. Cl.³ B60C 23/00
U.S. Cl. 340—58 6 Claims



1. An apparatus for continuously providing a measurement

of pressure in a tire of a vehicle, comprising: signal generating means; signal processing means; current supply means connected to said signal generating means and to said signal processing means; said current supply means supplying a first electrical current to said signal generating means and a second electrical current to said signal processing means, said current supply means having a circuit connection so that said first and second electrical currents are always in a substantially fixed ratio to each other; said signal generating means including transducer means for generating a first signal which is dependent on the pressure inside the tire; and a control means connected to said transducer means and to said current supply means, said control means being responsive to the first signal for varying said first electrical current in dependence on said tire pressure; said signal processing means monitoring said second electrical current thereby to provide a continuous indication of said tire pressure.

4,494,107

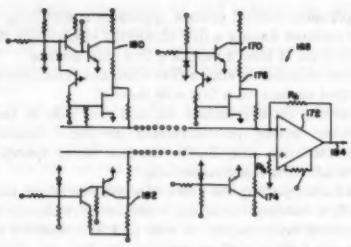
DIGITAL TO ANALOG CONVERTER

Robert W. Kearns, 20524 Rutherford Ave., Detroit, Mich. 48235, and James G. H. Quan, 14871 Lesure, Detroit, Mich. 48227

Continuation of Ser. No. 781,817, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 651,321, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 367,286, Jun. 5, 1973, abandoned, which is a continuation of Ser. No. 873,192, Nov. 3, 1969, abandoned. This application Apr. 2, 1981, Ser. No. 250,482

Int. Cl.³ H03K *13/02*; H03F *3/45*

U.S. Cl. 340—347 DA **1 Claim**



1. A digital-to-analog converter comprising a primary analog input network for receiving a part of a digital word and converting it into an analog signal, a secondary analog input network for receiving another part of the digital word and converting it into an analog signal with the maximum digital input word put into the secondary analog input network being nominally slightly less than the least change in the portion of the digital word input to the primary analog input network and an unbalanced differential amplifier connected to receive the output from the primary analog input network at one input terminal thereof and for receiving the output from the secondary analog input network at the other input terminal thereof in which the maximum amount of unbalance of the differential amplifier is nominally equal to the maximum analog signal from the secondary analog input network.

4,494,108

ADAPTIVE SOURCE MODELING FOR DATA FILE COMPRESSION WITHIN BOUNDED MEMORY

Glen G. Langdon, Jr., San Jose, and Jorma J. Rissanen, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

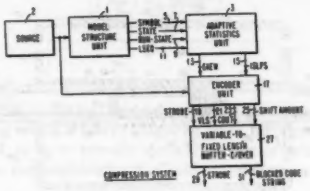
Continuation of Ser. No. 319,542, Nov. 9, 1981, abandoned. This application Jun. 5, 1984, Ser. No. 617,303

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 DD **2 Claims**

1. A machine implementable method for dynamically selecting conditioning states thereby enabling an efficient compression with fixed preselected implementation complexity in the adaptive compression of a symbol string generated from an N distinguishable symbol alphabet MARKOV type symbol source with adaptation in the run on piecewise stationary source statistics, the method steps comprising within a single pass process:

ascertaining the first $(k-1)<N$ symbols appearing M times, initially treating all symbols as a single conditioning state,



and thereafter distinguishing and removing at most k symbols as their occurrence count exceeds M where M varies according to the remaining number of states yet to be ascertained;

pairing each of the conditioning states with each symbol and determining the associated conditional symbol probability distribution; and

passing parameters indicative of the distribution to an extrinsic compression coding process.

4,494,109

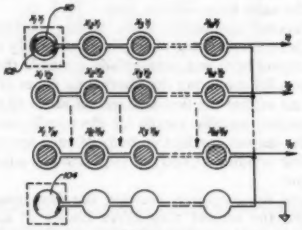
NONCONTACTING KEYBOARD EMPLOYING A TRANSFORMER ELEMENT

Victor M. Bernin, 105 E. Berkshire La., Mount Prospect, Ill. 60056

Continuation-in-part of Ser. No. 946,346, Sep. 2, 1978, Pat. No. 4,300,127. This application Jan. 28, 1981, Ser. No. 229,175

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 L **16 Claims**



1. A switch array comprising:

a plurality of transformers each having a primary winding and a secondary winding, said transformers being physically arranged to form a matrix comprising horizontal rows and vertical columns, said primary windings lying in a first plane and said secondary windings lying in a second plane parallel and in close proximity to said first plane with each of said primary windings being opposite to and aligned with one of said secondary windings;

first means for interconnecting said primary windings into a plurality of series chains of windings along said vertical columns;

a reference potential;

second means for interconnecting said secondary windings into a plurality of series chains of windings along said horizontal rows with each of said horizontal rows having a first and second output;

third means for interconnecting said first output of each of said horizontal rows together and for connecting said second output of one of said horizontal rows to said reference potential so that signals generated on said second

output of the remaining rows is equivalent to the signals present on secondary windings of that row minus the signals present on the secondary windings of said one row; and

a plurality of mutual inductance changing actuators associated with and adapted to be selectively positioned relative to all of said plurality of transformers except for the transformers comprising said one row.

4,494,110

KEYBOARD MODULES FOR USE IN DATA TERMINALS

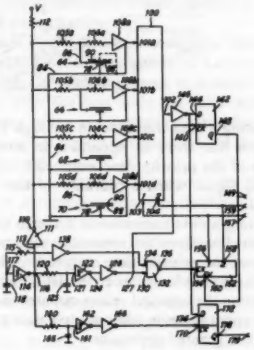
Antony J. Wakeling, and Alan D. Thompson, both of Fleet, England, assignors to Schlumberger Electronic (U.K.) Ltd., Farnborough, England

Filed Mar. 3, 1982, Ser. No. 354,410

Claims priority, application United Kingdom, Mar. 6, 1981, 8107181

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 R **7 Claims**



1. A keyboard module for use in a manually operable data terminal for communicating with a data processor, the module comprising:

a keyboard having a plurality of manually selectable keys, each of which represents a respective message or part of a message to be communicated to the processor, each key including first and second terminals, with each key being selectively actuable by movement of its second terminal to contact its respective first terminal, and wherein said first terminals are interconnected and directly grounded; and

a circuit connected to said first and second terminals and responsive to manual selection by touch without actuation of any key to produce a first output signal indicative of which key is selected, and further responsive to actuation of the selected key to produce a second output signal, said circuit including:

a pulse generator for generating a first train of pulse; a plurality of first delay circuits each including a respective one of said keys and connected to receive and delay the first train of pulses; and second and third delay circuits connected to receive and delay the first train of pulses so as to produce second and third trains of pulses each delayed by a respective and different time interval with respect to the first train, the delay time interval for the second train being intermediate respective first and second delays produced by each first delay circuit when its respective key is respectively not touched and touched and the delay time interval for the third train being greater than said second delay; said circuit being arranged to receive said first train via said first delay circuits and said second and third trains, and to produce said first or second output signal respectively when it receives a pulse of said second or third train respectively without having first received the corresponding pulse of said first train;

whereby the first output signal indicates that a desired key has been correctly selected and the second output signal enables the respective message or part of a message represented by the selected key to be communicated to the processor.

4,494,111

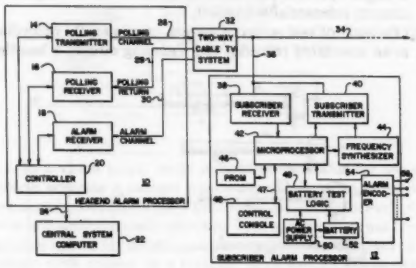
FREQUENCY AGILE SECURITY APPARATUS

Joseph D. Rocci, Lansdale; Stephen E. Crook, Horsham, and Marc Kauffman, Elkins Park, all of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,301

Int. Cl.³ G08B *1/08*; H04N *1/00*

U.S. Cl. 340—533 **6 Claims**



1. A subscriber security apparatus for use in conjunction with a cable communication system and headend apparatus including means for transmitting first and second command messages modulating a first radio frequency signal, and means for receiving from said subscriber security apparatus a polling return message modulating a second radio frequency signal and an alarm message modulating a third radio frequency signal, said subscriber security apparatus having an address associated therewith, said subscriber security apparatus comprising:

means for receiving said first and second command messages;

frequency control means for setting the respective frequencies of said second and third radio frequency signals;

means responsive to said means for receiving said first command message including an address specified in said first command message, and coupled to said frequency control means for setting the frequency of said second radio frequency signal to a value specified in said first command message, when said address of said subscriber security apparatus matches said address specified in said received first command message; and

means responsive to said means for receiving said second command message including an address specified in said second command message, and coupled to said frequency control means, for setting the frequency of said third radio frequency signal to a value specified in said second message, when said address of said subscriber security apparatus matches said address specified in said received second command message.

4,494,112

ULTRASENSITIVE APPARATUS AND MONITORING METHOD FOR DETECTING CHANGE IN FLUID FLOW

Stephen F. Streib, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 184,559, Sep. 5, 1980, Pat. No. 4,433,329. This application Aug. 18, 1982, Ser. No. 409,377

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—606 **8 Claims**

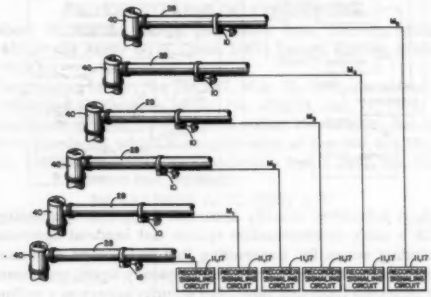
1. Method of providing detection of fluid flow in a series of relief flowlines at a central control center, wherein activation

of a series of control valves controlling discharge can be pinpointed, comprising:

(a) positioning at least one of a series of transducer-meters for sensing heat flux in a selected location that is (i) radially disposed exterior to at least one of said flowlines in heat conducting contact therewith while maintaining integrity of said at least one flowline radially intact and (ii) linearly disposed along said one flowline closely adjacent to at least one of said series of control valves so that fluid discharge through said at least one control valve can be accurately detected;

(b) simultaneously feeding signals from said one of transducer-meters to a corresponding series of recorder and signaling circuits located at said central control center wherein a single operator can monitor all recorder and signaling circuits substantially unaided;

(c) for each of said series of meters, continuously recording at an associated recorder and signaling circuit, a baseline



signal constant with time but above a predetermined threshold level, said baseline signal being indicative of a NO-FLOW steady state temperature condition within said at least one flowline at said selected location;

(d) monitoring change in fluid flow interior of said one flowline at said selected location by generating and recording a transient cascaded output signal proportional to transient heat flux detected exterior of said one flowline; at said control center, said recorded transient signal deviating in amplitude from said prior recorded baseline signal whereby said change in fluid flow can be accurately indicated thereby indicating the occurrence of said transient cascaded signal output at said control center so as to pinpoint location of one or more of said series of control valves undergoing discharge.

4,494,113

METHOD AND APPARATUS FOR SELF-CONTROL IN DISTRIBUTED PRIORITY COLLISION

Hiromasa Yamaoka; Yuzaburo Iwasa, and Kazuhisa Matunaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,891

Claims priority, application Japan, Mar. 13, 1981, 56-35378; Jun. 3, 1981, 56-84377

Int. Cl.³ H04Q 9/00

U.S. Cl. 340—825.5 **9 Claims**

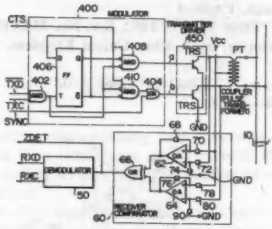
1. A signal transmission method for self-controlling priority among a plurality of distributed self-control apparatuses each connected to a common transmission time in a multidrop manner, wherein when request-to-send signals are provided from the apparatuses through said common transmission line, each of the apparatuses is allowed to use the common transmission line in turn in accordance with each priority level, comprising the steps of:

(a) assigning a priority time different from each other to a request-to-send (RTS) signal from each of the apparatuses,

(b) assigning another time shorter than any one of the different priority times to an interrupt request-to-send (IRTS) signal from each of the apparatuses, the another time being the same in all of the apparatuses,

(c) counting a clock signal to measure a first period wherein the transmission line is not used.

(d) granting a data transmission through the common transmission line from an apparatus when detecting a logical product signal obtained by ANDing the IRTS signal of the apparatus and a time coincidence detection signal issued when the value counted in the step (c) arrives at a predetermined value corresponding to the another time of the step (b), and if another IRTS signal from another apparatus is not issued,



(e) granting a data transmission through the common transmission line from an apparatus in accordance with the order of the priority time assigned to the request-to-send (RTS) signal when a plurality of the IRTS signals are issued.

(f) granting a data transmission through the common transmission line from an apparatus in accordance with the order of the priority time assigned to the request-to-send (RTS) signal when none of the IRTS signals is issued, and

(g) resetting the counted values counted in the step (c) in the other apparatuses in response to a data transmission signal from the granted apparatus.

4,494,114

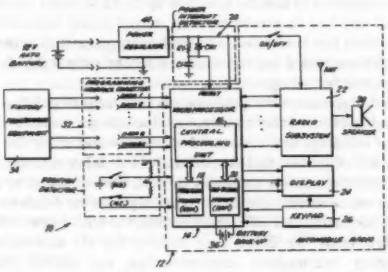
SECURITY ARRANGEMENT FOR AND METHOD OF RENDERING MICROPROCESSOR-CONTROLLED ELECTRONIC EQUIPMENT INOPERATIVE AFTER OCCURRENCE OF DISABLING EVENT

Norman Kaish, Whitestone, N.Y., assignor to International Electronic Technology Corp., Far Rockaway, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,115

Int. Cl.³ G08B 13/06; G06F 7/00

U.S. Cl. 340—825.31 **31 Claims**



1. A lock-out security arrangment for rendering electronic equipment having a normal operation inoperative after a disabling event has occurred, and for maintaining the equipment inoperative after the disabling event has terminated, comprising:

(a) a microprocessor having an internal, non-volatile, protected memory accessed solely by the microprocessor and

protected from interrogation external to the microprocessor, said microprocessor being operative for executing a program stored in the internal memory, said program having an operational routine for controlling the normal operation of the equipment, and a security routine for controlling the security of the equipment;

(b) said security routine having means for distinguishing between an initial execution of the security routine and a subsequent execution of the security routine;

(c) means responsive to the initial execution of the security routine, for storing a first code in a secured manner in the internal memory of the microprocessor such that the stored first code is protected from interrogation external to the microprocessor;

(d) code entry means operatively connected to the microprocessor, for entering a second code to the microprocessor;

(e) said security routine having code validity means for comparing the second code entered using the code entry means to the stored first code whose identity is protected from external interrogation;

(f) enabling means responsive to a completed initial execution, or to the subsequent execution, of the security routine, for enabling the microprocessor to execute the operational routine after the first code has been stored in the internal memory of the microprocessor, and for maintaining the equipment normally operational until the disabling event has occurred;

(g) detector means operatively connected to the microprocessor, for detecting when the disabling event has occurred; and

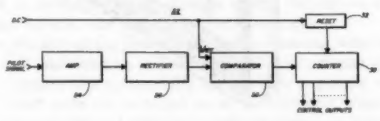
(h) disabling means responsive to the detector means and operatively connected to the microprocessor, for disabling the equipment from normal operation after the disabling event has occurred, said disabling means being further operative for maintaining the equipment disabled, even after the disabling even has terminated, until the second code matches the stored first code.

4,494,115

CONTROLLER FOR A LOCKED CARRIER DISTRIBUTED MULTIPLEXED TELEMETRY SYSTEM

Norman H. Gholson, Long Beach, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 15, 1981, Ser. No. 283,418
Int. Cl.³ H04Q *11/04*
U.S. Cl. 340—825.65 **6 Claims**



1. A controller for a locked carrier distributed multiplexed telemetry system comprising:

means for detecting the presence of a pilot signal;

means for counting each time said pilot signal cycles from off to on, a particular command to be executed being determined by the count of said counting means; and

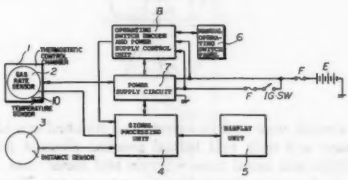
means for resetting said counting means when a d.c. power supply input is cycled from off to on.

4,494,116

APPARATUS FOR VISUALLY INDICATING A CURRENT TRAVEL ROUTE OF A VEHICLE

Katsutoshi Tagami; Tsuneo Takahashi, both of Saitama; Shinichiro Yasui, Tokyo; Masao Sugimura, Saitama, and Fumitaka Takahashi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1981, Ser. No. 298,633
Claims priority, application Japan, Sep. 4, 1980, 55-122892; Sep. 4, 1980, 55-122893; Sep. 4, 1980, 55-122895
Int. Cl.³ G08G *1/12*; G01P *15/00*
U.S. Cl. 340—995 **5 Claims**



1. In a visual travel route indicating apparatus for use in a vehicle wherein a current location point in terms of two-dimensional coordinates per a given unit distance of travel of the vehicle is arithmetically obtained from a current output from a distance sensor for detecting a current distance of travel of the vehicle with respect to a starting point and a current output from a gas rate sensor for detecting a current azimuthal deviation generated by the vehicle during a turning operation, the thus-obtained data on a current location of the vehicle changing from time to time as the vehicle travel progresses being stored in sequence so as to be appropriately processed for visually displaying a finite yet continuous path of travel of the vehicle, said indicating apparatus including at least a power source;

an improvement comprising:

a thermostatic control chamber, said gas rate sensor being isolated within the atmosphere of said thermostatic control chamber so as to permit heating thereof to a desired constant temperature;

power supply circuit means for detecting the on/off state of an ignition switch of said vehicle;

said power supply circuit means including relay means, operatively connected with said power source, for directly supplying power from said source to said thermostatic control chamber when said ignition switch is detected to be closed; and

self-holding circuit means operatively cooperating with said relay means for holding said relay means so as to supply power to said thermostatic control chamber when said ignition switch is detected to be opened.

4,494,117

DUAL SENSE, CIRCULARLY POLARIZED HELICAL ANTENNA

H. Paris Coleman, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,519
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—365 **9 Claims**

7. An orthogonal mode helical antenna comprising:

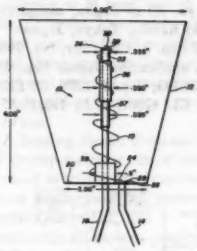
a helical antenna element with a base and a top;

a ground positioned at the base of said helical antenna element;

a first feed line that is a co-axial cable terminating at said ground plane and electrically coupled to the base of said helical antenna element;

a second feed line that is a co-axial cable passing through said ground plane and terminating at the top of said helical

antenna element and electrically connected thereto wherein said second feed line is substantially aligned along the axis of symmetry of said helical antenna element;



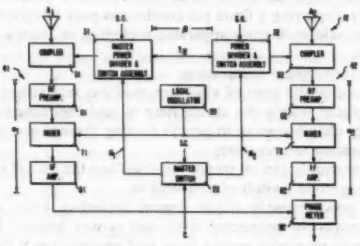
and a metal cone with its narrow end attached to said ground plane and with said helical antenna element positioned within said metal cone wherein said metal cone and said helical antenna element have a common axis of symmetry.

4,494,118

DIRECTION FINDING INTERFEROMETER INTERNAL CALIBRATION SYSTEM

Ross E. Graves, Santa Fe, N. Mex., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 18, 1983, Ser. No. 524,274
Int. Cl.³ G01S *5/02*
U.S. Cl. 343—424 **5 Claims**



1. An internal calibration system for use with a direction finding interferometer having a plurality or receiving antenna elements, a local oscillator, at least one phase meter, and a plurality of channel receiving means associated with each said receiving antenna element, each said channel receiving means including a radio-frequency preamplifier, a mixer connected to both said radio-frequency preamplifier and said local oscillator, and an internal intermediate-frequency amplifier connected to said mixer and one of said at least one phase meter, said internal calibrations system comprising:

plural power dividers, each power divider having an input and first and second outputs, each power divider being associated with one of said channel receiving means, the second output of each power divider being operatively connected to the associated of said channel receiving means;

a master switch operatively connected to said power dividers for directing a calibrate signal to selected of said power dividers;

a signal source for providing the calibrate signal to said master switch;

at least one inter-channel transmission line switchably connected to the first output of each of two of said power dividers; and

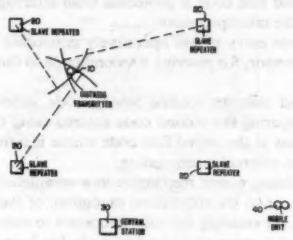
secondary switching means associated with each power divider to permit the calibrate signal to bypass said power divider while passing from one of said at least one inter-channel transmission line to the associated channel receiving means.

4,494,119

DISTRESS RADIOLOCATION METHOD AND SYSTEM

Fred Wimbush, Toronto, Canada, assignor to 122923 Canada Limited, Toronto, Canada

Filed Aug. 4, 1983, Ser. No. 520,327
Int. Cl.³ H04B *7/185*; G01S *5/02*
U.S. Cl. 343—457 **25 Claims**



1. A system for locating a signal source transmitting a short duration signal from an unknown location within an area of coverage, said system comprising:

receiving means at a plurality of known geographical locations for receiving the short duration signal, said receiving means including measuring means for developing a numerical representation of a magnitude of the received signal at each known location; and

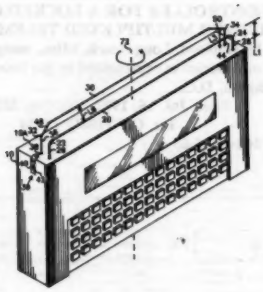
calculating means for numerically calculating, from the numerical representations and the known locations, the geographical location of the signal source.

4,494,120

TWO ELEMENT LOW PROFILE ANTENNA

Oscar M. Garay, North Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1983, Ser. No. 489,894
Int. Cl.³ H01Q *1/48*
U.S. Cl. 343—702 **3 Claims**



1. A low profile antenna comprising:

a counterpoise of electrically conductive material having a surface;

a passive element oriented substantially parallel to said counterpoise surface and situated at a predetermined first distance above said counterpoise surface, said passive element having first and second opposed ends each of which is electrically connected to said counterpoise surface; and

an active element situated adjacent and spaced apart from

said passive element in a plane substantially parallel to said counterpoise surface and at a second predetermined distance above said counterpoise surface and including a middle portion and first and second end portions, each of said portions exhibiting a respective predetermined length,

said middle portion being oriented substantially parallel to said passive element;

said first end portion extending angularly away from one end of said middle portion toward a first locus adjacent to the first end of said passive element at which point is designated the antenna feed-point, said feedpoint being separated from said counterpoise surface,

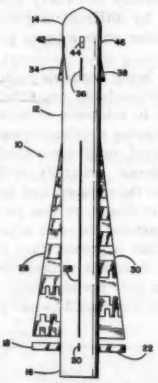
said second end portion extending from the remaining end of said middle portion toward a second locus adjacent to the second end of said passive element at which point said second end portion is electrically connected to said counterpoise surface.

4,494,121

DIRECTION FINDING ANTENNA

Carlton H. Walter; Peter Bohley, both of Columbus, Ohio, and Robert P. Couture, Irvine, Calif., assignors to Interstate Electronics Corporation, Calif.

Filed May 10, 1982, Ser. No. 376,292
Int. Cl.³ G09F 9/30
U.S. Cl. 343—708 **17 Claims**



1. A direction finding antenna system for use on an aerospace vehicle, said antenna system comprising:

a plurality of log periodic monopole antennas, wherein each of said antennas includes a plurality of antenna stubs arranged in a substantially log periodic sequence, wherein said stubs are mounted on an aerodynamic wing on the outside of said vehicle in order to conserve space inside said missile, and wherein at least one of said stubs undulates so as to produce lower resonant frequencies for said stubs; and

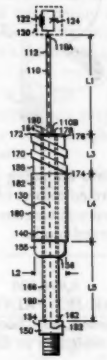
a feedline for each of said antennas and connected to said stubs so that adjacent ones of said stubs are electrically out of phase, so that performance of said plurality of said antennas is preferentially enhanced in a forward direction towards the nose of said vehicle thus improving the ability of said missile to track a target.

4,494,122

ANTENNA APPARATUS CAPABLE OF RESONATING AT TWO DIFFERENT FREQUENCIES

Oscar M. Garay, N. Lauderdale, and Quirino Balzano, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1982, Ser. No. 452,166
Int. Cl.³ H01Q 9/16
U.S. Cl. 343—722 **5 Claims**



1. An antenna exhibiting first and second predetermined resonant frequencies comprising:

a helically configured electrically conductive element having opposed ends, one end of said element being electrically coupled to a feed port;

a first electrically conductive, cylindrically shaped member having opposed ends, one end of said member being electrically coupled to the remaining end of said element, such that when radio frequency energy is applied to said feed port, said element and said first member cooperate to resonate at a first frequency;

a second electrically conductive member having opposed ends, one end of said second member being electrically coupled to said feedport;

said first and second members and said element being substantially aligned so as to share a common axis between the respective ends thereof, and

resonant circuit means, electrically coupled to the remaining end of said second member, such that when radio frequency energy is applied to said feed port, said second member and said resonant circuit means cooperate to resonate at a second resonant frequency.

4,494,123

SELF-ERECTING COMPOSITE ANTENNA STRUCTURE

Larry A. Moore, and John S. Walker, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 399,076, Jul. 16, 1983, abandoned, which is a continuation of Ser. No. 190,675, Sep. 25, 1980, abandoned. This application Aug. 8, 1983, Ser. No. 520,766
Int. Cl.³ H01Q 9/30, 1/08
U.S. Cl. 343—900 **6 Claims**

1. An antenna having a stored mode and an erected mode, said antenna comprising:

a solid, electrically conductive rod including a flexible material and a plurality of stiff fibers embedded in said flexible material so as to impart to said rod a flexural modulus of elasticity in a range of about 17.4×10^6 psi to about 20.6×10^6 psi and an average tensile strength in a range from about 280,000 psi to about 315,000 psi, said rod being capable of coiling into at least one complete loop in the stored mode and erecting into a vertical cantilever in the

form of a substantially unbent column in the erected mode; and

base means having said rod connected thereto adjacent one

end, said base means including a portion constructed to receive said rod coiled into at least one complete loop in the stored mode and said base means serving to anchor the one end in the erected mode.

4,494,124

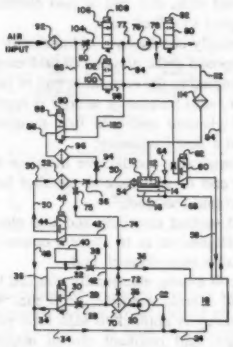
INK JET PRINTER

Michael J. Piatt, Englewood, and Theodore F. Williams, Beavercreek, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,481

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **24 Claims**



16. A method of supplying ink to the print head of a printer for producing a plurality of jet drop streams emanating therefrom, said printer having a source of ink, an ink supply line connected to said print head and having a supply valve thereon for opening and closing said supply line, a pump with an inlet for receiving fluid from said source and an outlet connected to said ink supply line, and an ink return line for conveying ink from said print head to said source and including outlet valve means thereon for opening and closing ink flow therethrough, comprising the steps of:

opening said supply valve to initiate ink flow from said pump through said supply line to said print head;

connecting a first ink recirculation line, including a fixed restriction thereon and accumulator means upstream thereof, between said pump outlet and said source, thereby rapidly increasing ink pressure in said first recirculation line, said ink supply line, and said print head;

closing said outlet valve when ink within said print head reaches a predetermined pressure thereby sending a pressure wave through said print head to initiate jet drop streams therefrom; and

disconnecting said first ink recirculation line from said pump outlet.

4,494,125

DIFFERENTIAL-PERMEABILITY FIELD-CONCENTRATING MAGNETIC READ/WRITE HEAD

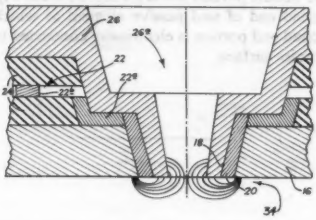
Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Fremont, Calif.

Continuation of Ser. No. 381,922, May 26, 1982, abandoned.

This application Mar. 7, 1983, Ser. No. 472,924

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.5 **10 Claims**



1. In an imaging system of the type employing a magnetic image-storage medium having a magnetizable facial expanse which is placeable operatively in an image-producing zone within the system, a magnetic read/write head comprising

selectively excitable thin-film magnetic pole means disposed adjacent said zone, and arranged to confront closely such a facial expanse, said pole means including inner and outer, substantially circularly symmetric pole portions characterized by different magnetic permeabilities, with that of said outer portion being greater than that of said inner portion,

said pole means being excitable to produce thereadjacent a pair of opposite-polarity magnetic poles having geometries effective to establish, in such an expanse when so placed in said zone, a defined magnetized region characterized by plural, multi-directionally oriented magnetic vectors distributed generally with spherical geometry with respect to the expanse, and further characterized by a magnetic flux density in that part of the region which becomes magnetized through adjacency with said outer pole portion that is greater than that of the part of the region which becomes magnetized through adjacency with said inner pole portion, and

means operatively connected to said pole means for exciting the same.

4,494,126

THERMAL RECORDING HEAD DRIVE DEVICE

Hidemasa Todoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,412

Claims priority, application Japan, Feb. 12, 1982, 57-19750

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **11 Claims**

1. A thermal recording head drive device in which a plurality of heat generating resistance elements are arranged in an array over a recording width, comprising:

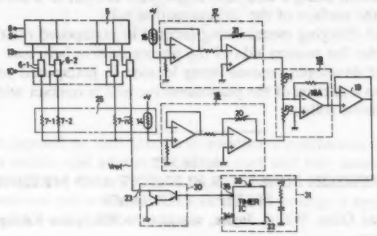
an analog shift register which receives an analog input signal the amplitude of which varies according to densities of picture elements to be recorded, said analog shift register shifting said analog signal input bit by bit according to a clock signal to provide parallel outputs corresponding to an entire line of picture elements to be recorded;

current control circuit means for controlling currents flowing in respective ones of said heat generating resistance

elements, said current control circuit means being connected in series with respective ones of said heat generating resistance elements, and said current control circuits receiving said parallel outputs of said shift register;

voltage control circuit means connected in series between a common connection terminal of series circuits of said heat generating resistance element and respective current control circuit means and a power source terminal;

means for detecting a temperature at at least one predetermined position in said device the temperature of which



affects a recording density of picture elements recorded by the recording head drive device; and

means for controlling a predetermined parameter of said voltage control circuit according to the detected temperature, wherein after analog signals representing an entire line of picture elements to be recorded have been stored in said analog shift register, currents are applied through said heat generating resistance elements for a predetermined period of time according to the corresponding outputs of said shift register and to said parameter of said voltage control circuit means.

4,494,127

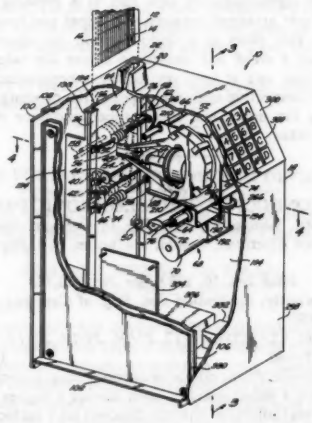
APPARATUS AND METHOD FOR RECORDING BOTH MACHINE-READABLE AND PRINTED INFORMATION

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Continuation of Ser. No. 417,507, Sep. 13, 1982, abandoned, and Ser. No. 189,966, Sep. 23, 1980, abandoned. This application Jan. 30, 1984, Ser. No. 574,950

Int. Cl.³ G07C *1/14*

U.S. Cl. 346—82 **20 Claims**



1. A method for recording both magnetic and printed information on a record card, said method comprising the steps of: moving said card into a housing in a first direction past a stationary transducer adapted for reading and recording magnetic information on said card; moving said card in the opposite direction out of said housing; positioning a printer for printing characters on said card in a line substantially parallel to the direction of motion of said card, so that the movement of said card past said transducer creates a corresponding movement of said card past said printer; and controlling the timing at which both said transducer and said printer record information in correspondence with said movements so that both said magnetic and said printed information are spaced along said member by said movements and said printer records information during motion of said card in said opposite direction.

4,494,128

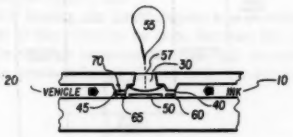
GRAY SCALE PRINTING WITH INK JETS

John L. Vaught, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 17, 1982, Ser. No. 419,299

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **7 Claims**



1. A binary fluid flow valve comprising:

a capillary; and

a heat source coupled to the capillary for boiling fluid in the capillary, to create a stationary vapor bubble which stops the fluid from flowing in the capillary.

4,494,129

ELECTROSTATIC PRINTING APPARATUS

Vladimir Gretchev, Thornhill, Canada, assignor to Delphax Systems, Mississauga, Canada

Filed Dec. 3, 1982, Ser. No. 446,821

Claims priority, application Canada, 391,543

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—154 **7 Claims**

1. Apparatus for controlling the operation of a matrix of ion deposition points of an electrostatic printer, the ion deposition points being defined by the intersection of a plurality of first electrodes with a plurality of second electrodes to provide a pattern of charge on a rotatable electrostatically chargeable surface corresponding to an image represented by a digital raster scan signal, the plurality of first electrodes being parallel to the axis of rotation and the plurality of second electrodes being located transverse to said plurality of first electrode in a common plane, the apparatus comprising:

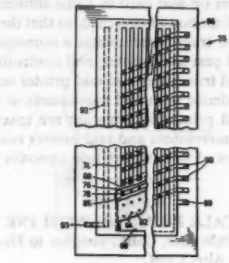
data reformatting means for receiving a digital raster scan input signal, said data reformatting means processing the digital input signal into a plurality of data groups, each data group having the same number of bits, the number of bits being the same as the number of second electrodes, and the number of groups being the same as the number of first electrodes, memory means connected to the data reformatting means for storing the data groups, motion control means responsive to the rotation of the chargeable surface to initiate a scanning operation to energize, in a predetermined sequence, the matrix of ion deposition points,

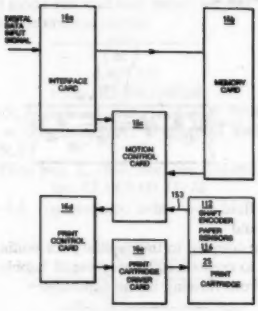
first electrode energizing means connected to said motion control means to energize said plurality of first electrodes successively during said scanning operation in accordance with the data groups stored in the memory means

second electrode energizing means for energizing said plurality of second electrodes in accordance with the data in a

respective one of said data groups during the energization of the corresponding first electrodes,

said energization being continuously performed in accordance with the data in the memory means whereby, in use, a pattern of charge is deposited on said rotatable electrostatically changeable surface corresponding to the image read by the digital raster scan signals.





4,494,130

LASER PRINTER

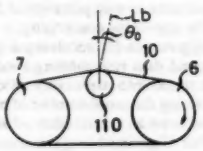
Yutaka Kaneko, Yokohama, and Yokata Takashi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 15, 1982, Ser. No. 398,630

Claims priority, application Japan, Jul. 15, 1981, 56-109273; Oct. 31, 1981, 56-174735

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—160 **10 Claims**



1. In a laser printer of the type having:

a photosensitive member of the endless belt type trained over support means and driven for travel while having its position of travel regulated by said support means, said support means including one drive roller and at least one follower roller and serving as regulating means;

means for charging the surface of the photosensitive belt;

a scanning and exposing device including a laser beam irradiating means, a modulating means for modulating said laser beam in accordance with image signals, and means for deflecting the path of said laser beam to be incident on the surface of the photosensitive belt; and

means for developing an electrostatic latent image formed on the surface of the photosensitive belt by scanning thereof by the laser beam;

the improvement comprising:

said means for deflecting being arranged such that the laser beam is incident on the surface of a portion of the photosensitive belt in contact with the regulating means or in the vicinity thereof, the angle of incidence of the laser beam being a non-zero angle with respect to a normal to the surface of the photosensitive belt;

said charging means being located in juxtaposed relation to the flat tension side of the photosensitive belt; and

said developing means being located in juxtaposed relation to a portion of the photosensitive belt in contact with said drive roller.

4,494,131

JOSEPHSON JUNCTION ELEMENT AND METHOD OF MAKING THE SAME

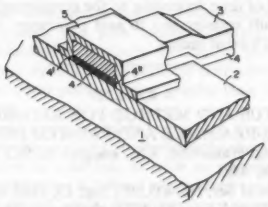
Hiroshi Ohta, Wako, Japan, assignor to Rikagaku Kenkyusho, Japan

Continuation-in-part of Ser. No. 151,693, May 20, 1980, Pat. No. 4,366,494. This application Oct. 27, 1981, Ser. No. 315,505

Claims priority, application Japan, Oct. 31, 1980, 55-153464; Dec. 20, 1980, 55-181045; Dec. 20, 1980, 55-181046; Dec. 20, 1980, 55-181047

Int. Cl.³ H01L *27/12, 45/00, 49/02, 39/22*

U.S. Cl. 357—5 **6 Claims**



1. A Josephson junction element comprising a lower strip-like superconductor thin film, an upper strip-like superconductor thin film arranged at an angle to and in crossing relation to said lower superconductor thin film at a crossing area, an insulator layer arranged between said upper and lower superconductor thin films at a region within the crossing area thereof, and a weak link extending across the sides of said insulator layer and at least one of the superconducting thin films at the respective opposite edges of the crossing area and connecting the upper and lower superconductor thin films with each other.

4,494,132

SEMICONDUCTOR OPTO-ELECTRONIC SWITCH

Erhard Kohn, Leingarten, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,733

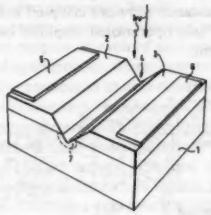
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105050

Int. Cl.³ H01L *27/12, 29/06, 29/04, 27/14*

U.S. Cl. 357—30 **11 Claims**

1. An opto-electronic component comprising: a semiconductor substrate; a semiconductor layer having a higher conductivity then said substrate directly disposed on a surface of said substrate; a V-shaped groove extending from the surface of said semiconductor layer through said semiconductor layer at least to said surface of said substrate and subdividing said

semiconductor layer into two separate semiconductor regions; a respective ohmic contact electrode disposed on the outer surface of each of said two semiconductor regions; and said substrate is sensitive to irradiation of the portion of its said



surface exposed by said groove to produce a conductive connection within said substrate and between said two semiconductor regions, whereby upon such irradiation current can flow between said contact electrodes when a voltage is applied across said contact electrodes.

4,494,133

INFRARED SENSITIVE PHOTO DIODE

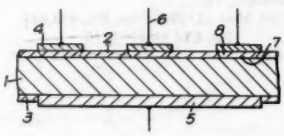
Anthony B. Dean; Robin F. C. Farrow, both of Malvern, England; Piero Migliorato, Rome, Italy; Anthony M. White, and Gerald M. Williams, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 7, 1982, Ser. No. 386,082

Claims priority, application United Kingdom, Jun. 23, 1981, 8119440

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **12 Claims**



1. An infra red sensitive photo diode comprising:
a substrate of $Cd_xHg_{1-x}Te$ of a first conductivity type,
a layer of CdTe of a second conductivity type on the substrate, the substrate and layer forming a p-n heterojunction, and
a plurality of elect.ical terminals respectively connected to the substrate and to the layer.

4,494,134

HIGH VOLTAGE SEMICONDUCTOR DEVICES COMPRISING INTEGRAL JFET

Eric J. Wildi, Clifton Park, and Michael S. Adler, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,346

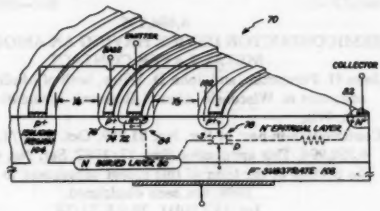
Int. Cl.³ H01L *27/02*

U.S. Cl. 357—43 **8 Claims**

1. In a semiconductor device of the type including a bulk substrate of one dopant type, a layer of opposite dopant type disposed atop the substrate, an isolation region of same dopant type as the substrate integrally connected to the substrate and adjoining the periphery of the layer, a first region of the opposite dopant type extending into the layer from the interior of the upper surface thereof, and a second region of the one dopant type extending into the layer from the upper surface thereof and surrounding the first region, the improvement comprising

(a) a third highly doped region of the opposite dopant type disposed between the layer and the substrate, beneath the second region and surrounding the first region;

(b) a fourth region of the one dopant type extending into the layer from the upper surface thereof, the fourth region



surrounding the first region and, in turn, being surrounded by the second region; and

(c) means for biasing the fourth region to a potential proximate that of the substrate so as to increase the maximum attainable voltage between the first and second regions when the semiconductor device is in a current-blocking state.

4,494,135

PROGRAMMABLE READ ONLY MEMORY CELL HAVING AN ELECTRICALLY DESTRUCTIBLE PROGRAMMATION ELEMENT INTEGRALLY FORMED WITH A JUNCTION DIODE

Michel Moussie, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

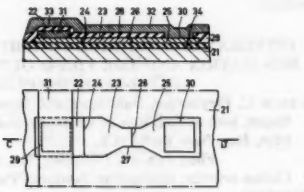
Continuation of Ser. No. 154,251, May 29, 1982, abandoned, which is a continuation of Ser. No. 946,261, Sep. 27, 1978, abandoned. This application Sep. 28, 1982, Ser. No. 425,147

Claims priority, application France, Apr. 6, 1976, 78 10208; Sep. 30, 1977, 77 29477

The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.

Int. Cl.³ H01L *29/04, 27/10, 45/00;* G11C *17/06*

U.S. Cl. 357—59 **4 Claims**



1. A semiconductor device comprising a programmable read-only memory having a plurality of programmable memory cells, which comprises:
a semiconductor body;
a thermally and electrically insulating layer on said body;
a thin layer of polycrystalline semiconductor material extending on said insulating layer and having regions of opposite type conductivity and a necked-down region;
at least one first p-n junction diode formed between said regions of opposite type conductivity in said thin layer of polycrystalline semiconductor material; and
an electrically destructible programmation element integrally formed with each said first p-n junction diode in said thin layer of polycrystalline semiconductor material to form a programmable memory cell, said programmation element comprising a second shortable p-n junction

diode formed in said necked-down region of said thin layer and having two semiconductor regions of opposite conductivity type which form the junction, said second diode being connected back-to-back and in series with said first diode, the connected-together regions of said first and second diodes comprising a common region of said thin layer.

4,494,136

SEMICONDUCTOR DEVICE HAVING AN AMORPHOUS METAL LAYER CONTACT

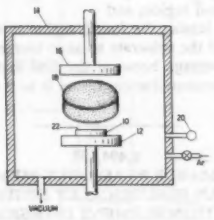
John H. Perepezko, and John D. Wiley, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 81,859, Oct. 4, 1979, Pat. No. 4,350,994. This application Sep. 17, 1982, Ser. No. 419,589

The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.

Int. Cl.³ H01L *29/12, 23/54*

U.S. Cl. 357—67 **16 Claims**



1. A metallization device characterized by resistance to corrosion and suitably for high temperature applicantions which comprises

a base selected from the group consisting of semiconductor devices, insulators, ohmic contacts, Schottky barrier contacts, rectifying contacts, metal interconnects, bonded lead wires and gate metallizations and,

bonded to the surface of said base, a layer of a metal elected from the group consisting of a transition metal, a transition metal/normal metal alloy and a transition metal/metalloid alloy, said layer being in an amorphous state.

4,494,137

INTEGRATED INTERFACE CIRCUIT BETWEEN THE RGB MATRIX AND THE VIDEO OUTPUT STAGES OF COLOR-TELEVISION SETS

Laurin C. Freyberger, Bahlingen, and Bernd Novotny, Gundelfingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,824

Claims priority, application European Pat. Off., Jul. 8, 1981, 81105292

Int. Cl.³ H04N *9/12, 9/535*

U.S. Cl. 358—27 **20 Claims**

1. In a color television or the like, the combination comprising:

an RGB matrix having a plurality of output amplifiers, each of said output amplifiers being associated with one of the plurality of chrominance channels and providing a video signal circuit at its output; each having a low output impedance;

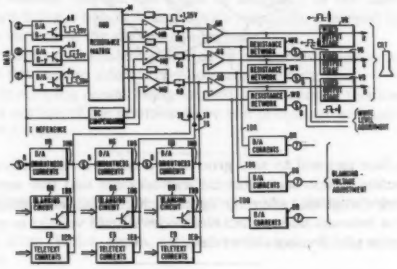
a plurality of video output stages for driving a picture tube or the like;

a plurality of interface circuits, each of said interface circuits coupling the output of one of said plurality of output amplifiers to an input of a corresponding one of said plurality of video output stages, each of said plurality of interface circuits comprising:

an operational amplifier having first and second complementary inputs and an output, said output being coupled to said input of said corresponding one of said plurality of video output stages;

a low-value resistor coupled between the output of said one of said plurality of output amplifiers and said first input;

an adjustable resistance network coupled between said second input and said operational amplifier output for white level adjustment;



blanking voltage adjustment means for supplying a blanking voltage control current to said second input;

brightness means for coupling a brightness control current to said first input; and

blanking means for coupling a blanking control current to said first input.

4,494,138

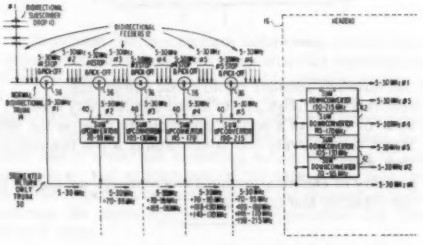
SEGMENTED UPSTREAM MANAGEMENT FOR CABLE TELEVISION

Richard L. Shimp, Harrisonburg, Va., assignor to ComSonics, Inc., Harrisonburg, Va.

Filed May 11, 1983, Ser. No. 493,614

Int. Cl.³ H04N *7/10*

U.S. Cl. 358—86 **6 Claims**



1. A segmented upstream management system for a bidirectional coaxial network, said network including at least one bidirectional trunk and a plurality of bidirectional feeders connected to said trunk, each of said feeders having a plurality of drops, said bidirectional trunk being connected to a hub or headend site from which broad band communication signals eliminate for transmission to each of said drops and to which narrow band communication signals propagate from each of said drops, said management system comprising:

a plurality of rerouting devices spaced along said bidirectional trunk at selected intervals so as to divide the number of said drops connected to said trunk by said feeders into groups, each of said groups including a predetermined number of said drops, each of said rerouting devices being operative to divert said narrow band communication signals to an output port thereof;

a plurality of upconverters each connected to an output port of a corresponding one of said rerouting devices, each of said upconverters translating said narrow band communication signals from the output port of its corresponding rerouting device to a different one of a plurality of predetermined higher frequency bands;

a return only trunk connected between said hub or headend site and the outputs of each of said upconverters; and

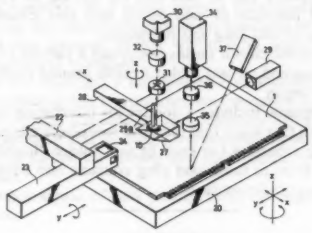
a plurality of synchronous down converters at said hub or headend site connected to said return only trunk, each of said down converters translating a different one of said plurality of predetermined higher frequency bands to the original narrow band communications signals corresponding to one of said groups, temporal dependence of said narrow band communications signals being preserved by said upconverters and said synchronous down converters.

4,494,139

AUTOMATIC ASSEMBLY SYSTEM

Yoshihiro Shima, Kodaira; Seiji Kashioka, Hachioji; Takeshi Uno, Sayama, and Kunio Suzuki, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,456
Claims priority, application Japan, Apr. 3, 1981, 56-49313
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—101 **34 Claims**



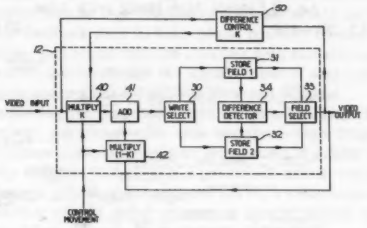
1. An automatic assembly system wherein parts supplied from a feeder are held by a holder means and are automatically mounted onto predetermined positions of a circuit board; comprising a first image pickup device which images at least a portion of said circuit board, said first image pickup device has a fixed field of view and receives images of a plurality of places on said circuit board, a second image pickup device which images at least a portion of the part held by the holder means, said second image pickup device has a movable field of view and receives images of a plurality of places on said part held by the holder means with said holder means kept fixed, a signal processor means which processes an output of said first image pickup device to detect a deviation of said circuit board from a reference position and which also processes an output of said second image pickup device to detect a magnitude of deviation between said part and the predetermined position of said circuit board, said signal processor means processes the plurality of input images from said first and second image pickup devices so as to detect the respective positional deviations of said circuit board and said part, and a positioning device which operates under control of said signal processor so as to adjust said predetermined position of said circuit board to a position opposing to said part and also to move said part toward said circuit board.

4,494,140

T.V. APPARATUS FOR MOVEMENT CONTROL

Peter C. Michael, Basingstoke, England, assignor to Micro Consultants Limited, Berkshire, England

Filed Jan. 19, 1982, Ser. No. 340,619
Claims priority, application United Kingdom, Jan. 22, 1981, 8101916
Int. Cl.³ H04N *7/18, 7/12, 5/21*
U.S. Cl. 358—105 **13 Claims**



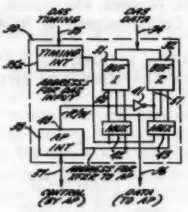
1. A video processing system comprising frame storage means for storing incoming pic re information from first and second fields, means for determining any difference in the picture information attributable to movement, control means for reducing the movement content made available from the frame storage means to reduce bandwidth requirements, and feedback means for providing at least a part of the previously stored information for use with at least part of the incoming information to provide residual persistence for moving portions of the picture, said feedback means including an arithmetic processor for manipulating the stored and incoming information in selected proportions determined by the control means.

4,494,141

DUAL PURPOSE ARRAY PROCESSOR FOR A CT SCANNER

Richard A. Altekruse, Sussex, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 428,761
Int. Cl.³ H04N *7/13, 7/18*
U.S. Cl. 358—111 **2 Claims**



1. In a CT scanner having a host computer and an array processor interconnected to cooperate in producing CT images from acquired detector data, the improvement comprising, a data acquisition system associated with the detector and having the ability to produce detector data at a rate faster than the maximum continuous input data rate of the host computer, means interfacing said array processor to the data acquisition system including timing means controllable by the data acquisition system at its data rate and control means for responding to array processor instructions, digital filter means in the array processor for compressing the data acquisition system data to produce a filtered data rate compatible with the host computer,

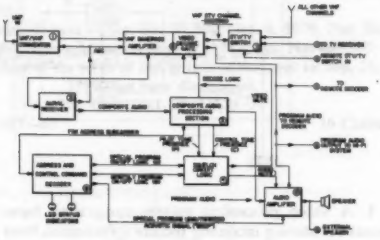
and means for transferring the compressed data to the host computer for storage and further processing.

4,494,142

METHOD OF AND APPARATUS FOR SCRAMBLED TELEVISION PROGRAM ADDRESSABLE SUBSCRIPTION SELECTION AND DECODING

Kantilal Mistry, Freehold, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Nov. 20, 1981, Ser. No. 323,280
Int. Cl.³ H04N 7/16; H04K 1/02, 1/04
U.S. Cl. 358—118 **22 Claims**



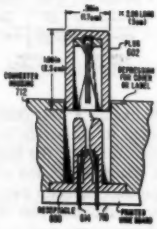
1. A method of subscription scrambled television decoding of ordinary scrambled programs transmitted with a pilot-tone-controlled control signal and of special subscription scrambled programs transmitted with a different control signal, that comprises, receiving the scrambled ordinary programs and decoding the same in response to said pilot-tone-controlled control signal; locking out the unsubscribed decoding of special scrambled programs upon receiving said different control signal, but with continued decoding of the ordinary scrambled programs; detecting transmitted unique address information for a special program subscribing receiver; checking the address information to insure its correctness; and thereupon pre-setting in a memory an over-ride of said different control signal; and, in response to said over-ride, enabling the receiving-decoding of said special programs when transmitted and received.

4,494,143

TELEVISION DESCRAMBLER WITH SECURITY PLUG HAVING FOLDED FLEXIBLE PRINTED CIRCUIT BOARD PROVIDING TIER TAG MEMORY

Richard B. Lovick, Glendale, and William L. Firestone, Sepulveda, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,246
Int. Cl.³ H04N 7/16; H04K 1/04; H01R 33/30, 13/62
U.S. Cl. 358—122 **3 Claims**



1. An improved security arrangement for a television signal decoder, comprising:

receiving means for receiving scrambled television signals, said scrambled signals including identification tier tags indicative of the nature of the program then being received:

tier tag sensing means coupled to said receiving means for sensing said tier tags;

controllable descrambling means coupled to said receiving means for descrambling said scrambled television signals when said controllable descrambling means is enabled;

memory means associated with said decoder, the contents of said memory means establishing the tiers of programs to which said decoder will respond; and

comparison means coupled to said tier tag sensing means and to said memory means for enabling said descrambling means when said tier tags are in a particular relationship with the contents of said memory for decoding said scrambled television signals;

wherein the improvement lies in that said memory means comprises;

first mating means coupled to said comparison means;

second mating means adaptable for being physically mated with said first mating means for establishing electrical connections therewith; and

electrical circuit means interconnected with said second mating means, the nature of said electrical circuit means being predetermined to establish said particular relationship for enabling said descrambling means for programs of particular natures of which said decoder is to respond; and wherein

said first mating means comprises a multielement receptacle having spring contacts disposed on two sides of a channel;

said second mating means comprises a multielement plug having contacts formed on a folded flexible printed circuit board for mating with said receptacle contacts, said board being secured at the fold thereof to one end of a housing, the opposite end of said housing having an opening to enable insertion of said board into said channel upon mating of said plug and receptacle;

said electrical circuit means comprises a pattern of conductors disposed on said folded flexible printed circuit board; and wherein

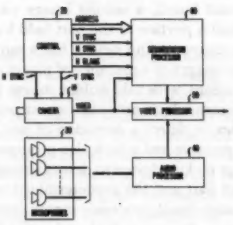
said receptacle includes a divider for bifurcating said channel such that when said plug and receptacle are mated said divider separates the ends of said folded flexible circuit board so as to bring said plug contacts into contact with said receptacle contacts.

4,494,144

REDUCED BANDWIDTH VIDEO TRANSMISSION

Earl F. Brown, Piscataway, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1982, Ser. No. 392,745
Int. Cl.³ H04H 7/12
U.S. Cl. 358—133 **12 Claims**



7. Apparatus for reducing the bandwidth of video camera signals comprising:

means for dividing the image represented by said video signals into segments; and

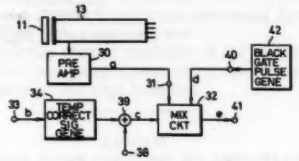
means for automatically altering said video signals in accor-

dance with an attribute of said image within said segments to reduce said bandwidth of video camera signals to be transmitted.

4,494,145
TEMPERATURE COMPENSATION CIRCUIT IN A PICKUP TUBE DEVICE

Seigo Kokufukata, and Tetsuya Sekido, both of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 10, 1982, Ser. No. 416,645
Claims priority, application Japan, Sep. 16, 1981, 56-145786
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—163 **6 Claims**



1. A temperature compensation circuit in a pickup tube device comprising a pickup tube, a bias lighting device provided at the front surface of said pickup tube for irradiating a bias light, a circuit for generating a shading compensation signal, and a circuit for supplying a black gate pulse, said temperature compensation circuit comprising:

a temperature compensation signal generating circuit for generating a temperature compensation signal for cancelling variation in a signal current component from said pickup tube due to variation in the bias light obtained from said bias lighting device which is in accordance with temperature variation;

means for obtaining a multiplexed compensation signal by multiplexing the temperature compensation signal generated by said temperature compensation signal generating circuit with said shading compensation signal; and

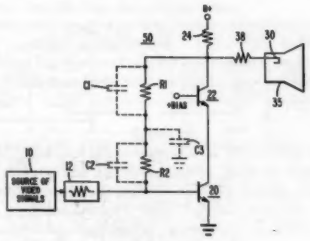
a mixing circuit for mixing said multiplexed compensation signal,

an output signal of said pickup tube, and said black gate pulse.

4,494,146
WIDEBAND KINESCOPE DRIVER AMPLIFIER

Saiprasad V. Naimpally, Indianapolis, and James C. Tallant, II, Hamilton, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1983, Ser. No. 515,851
Int. Cl.³ H04N *5/14, 5/68*; H03K *5/00*
U.S. Cl. 358—184 **8 Claims**



1. In a video signal processing system including an image reproducing device for displaying video information in response to video signals supplied thereto from a source of video signals, a driver amplifier stage for supplying said video signals to said image reproducing device comprising:

an input signal path;

an amplifier with a signal input for receiving input video signal from said source conveyed via said input signal path, and a signal output from which amplified video signals are provided to said image reproducing device; and

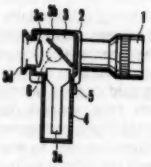
a degenerative feedback path coupled from said amplifier output to said input signal coupling path, wherein for improving the high frequency response of said amplifier said feedback path includes plural resistors connected in series, said plural resistors coacting with parasitic capacitances associated with the signal output of said amplifier stage and with said feedback path; and wherein

for reducing the magnitude of an unwanted ringing characteristic associated with said improved high frequency response said plural resistors are selected to exhibit mutually different values with a prescribed mutual ratio, and the one of said plural resistors having a value larger than another of said plural resistors is located nearest to said amplifier output.

4,494,147
VIDEO CAMERA

Yoshio Komine, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 364,889
Claims priority, application Japan, Apr. 16, 1981, 56-57449
Int. Cl.³ H04N *5/26*
U.S. Cl. 358—209 **1 Claim**



1. A video camera comprising:

a lens system for forming an object image;

image pick up means for converting the object image into an electrical signal;

a cathode ray tube responsive to the electrical signal for producing a display;

finder means for visually recognizing an image picture displayed on said cathode ray tube;

reflecting optical means, disposed between said cathode ray tube and said finder means, for directing the image picture on said cathode ray tube to said finder means;

a grip casing for supporting the camera and for holding said cathode ray tube, said reflecting optical means and said finder means;

a first casing for holding said image pick up means and said lens system;

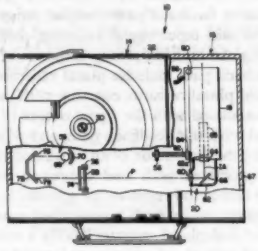
rotary connecting means for rotatably connecting said first casing and said grip casing and for including an opening through which a cable for transmitting the electrical signal obtained in said image pick up means to the cathode ray tube passes; and

a limiting member for limiting the rotation angle of said rotary connecting means between the position at which a longitudinal direction of said first casing is almost parallel to that of said grip casing and that at which the longitudinal direction of said first casing is almost vertical to that of said grip casing.

4,494,148
COMPACT VIDEO SLIDE PROJECTOR

Thomas A. Svatek, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 30, 1982, Ser. No. 430,524
Int. Cl.³ H01J 29/89
U.S. Cl. 358—226 2 Claims



1. A compact video slide projector for providing video image signals that represent an image recorded on a slide transparency, said projector comprising:

a housing;

a slide holder located in an optical image projection path extending along a first direction within said housing;

a light source for illuminating a slide in said holder to project an optical image of the recorded image on the slide along said projection path;

an elongated video camera, including an optical image input section at one end thereof, for receiving optical image bearing light provided along an input axis directed to said input section and being substantially parallel to the long dimension of said camera, and for converting the received image light into representative video signals that are available at a camera output;

means for mounting said camera in said housing so its long dimension extends in a second direction substantially perpendicular to said first direction with said input section closest to said projection path so that said input axis and said projection path are substantially mutually perpendicular;

optical means between said holder and said input section for directing image light from said projection path along said input axis so that an optical image of the recorded image on the slide in said holder is provided to said camera input section; and

a slide changing mechanism for selectively moving slides into and out of said holder, said slide changing mechanism being located within an included angle space bounded along two sides by said elongated camera and said projection path having said holder therein.

4,494,149
FACSIMILE COMMUNICATION DATA RECORDING APPARATUS FOR FACSIMILE TRANSCEIVER

Noboru Furukawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

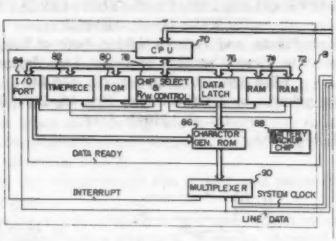
Filed Sep. 14, 1981, Ser. No. 301,666
Claims priority, application Japan, Sep. 22, 1980, 55-131974; Sep. 22, 1980, 55-131975; Sep. 22, 1980, 55-131976
Int. Cl.³ H04N 1/32
U.S. Cl. 358—257 12 Claims

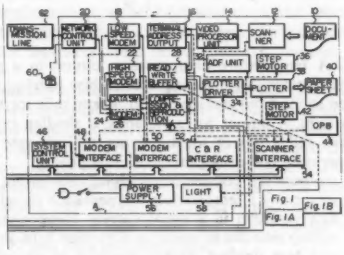
1. A facsimile communication data recording apparatus for a facsimile transceiver having a transmitter and a receiver provided with a printing means, comprising:

a central processing unit connected to the facsimile transceiver for controlling reading/writing operation of administrant data which is generated by the facsimile transceiver during operation thereof;

memory means connected to the central processing unit for storing the administrant data at each time of communication by the facsimile transceiver; and

control means for controlling the memory means and the printing means such that the administrant data stored in the memory means are read by the central processing unit and printed out by the printing means when an amount of the administrant data stored in the memory means reaches a predetermined value.

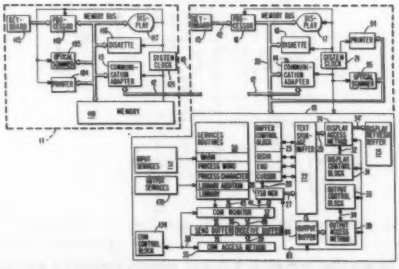




4,494,150
WORD AUTOCORRELATION REDUNDANCY MATCH FACSIMILE COMPRESSION FOR TEXT PROCESSING SYSTEMS

Norman F. Brickman, Potomac, and Walter S. Rosenbaum, Bethesda, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,704
Int. Cl.³ H04N 7/12
U.S. Cl. 358—260 11 Claims



1. A method for encoding and transmitting a text document

from a first information processing system to a second remote information processing system comprising the steps of:

(a) storing a library of addressable text strings in said first information processing system;

(b) storing an identical library of addressable text strings in said second remote information processing system;

(c) comparing each text string in a text document to be transmitted to the library in said first information processing system;

(d) transmitting only the library address and the page location of each text string that compares equal to a library text string;

(e) storing each text string that compares unequal in the library memory of said first information processing system;

(f) transmitting each text string that compares unequal to said second remote information processing system for storage in its library memory; and

(g) reconstructing the text document at the second remote information processing system using the transmitted library addresses and page locations.

4,494,151

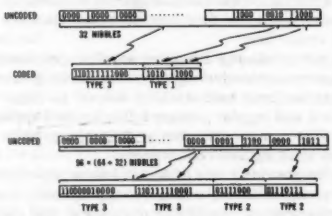
4-PIXEL RUN-LENGTH CODE FOR DATA COMPRESSION

Henry H. Liao, Rossmore, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 54,389, Jul. 2, 1979, abandoned, and Ser. No. 150,780, May 19, 1980, abandoned. This application Feb. 9, 1982, Ser. No. 347,203

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—261 **20 Claims**



1. A method for the compression of serial binary data comprising the steps of:

separating said serial data into bit nibbles,

counting the run length of all-zero nibbles received prior to receiving a terminating nibble,

converting the run length of all-zero nibbles into a first code word portion,

converting the terminating nibble data pattern into a second code word portion, the more common terminating nibble data patterns being compressed into second code words of shorter length than the original data,

generating a plurality of flag bits to identify the format of said code word, and

combining the first and second code word portions and said flag bits into a code word a multiple of n bits long.

4,494,152

CHARACTER AND IMAGE DATA READING SYSTEM

Masami Kurata, and Takashi Ohmori, both of, Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,778

Claims priority, application Japan, Jan. 12, 1981, 56-2121

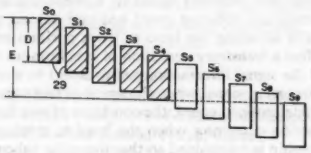
Int. Cl.³ H04N *1/10*

U.S. Cl. 358—293 **9 Claims**

1. A character and image data reading system for a character and image data reading apparatus, comprising:

a solid image pickup element having a light receiving window for reading character and image data therethrough; and

an auxiliary scanning mechanism for moving said light receiving window releative to an original by a predetermined distance during an integration period of said solid image pickup element, and predetermined distance being equal to or longer than a first calculated length which is obtained by subtracting a length in the auxiliary scanning direction of said light receiving window from an auxiliary scanning width for one line and said predetermined distance being shorter than said auxiliary scanning width for one line;



said solid image pickup element reading chaacter and image data while said light receiving window is being moved in the auxiliary scanning direction, when said first calculated length in the auxiliary scanning direction of said light receiving window is shorter than the auxiliary scanning width for one line; and,

memory means for receiving character and image data read by said solid image pickup element during said integration period.

4,494,153

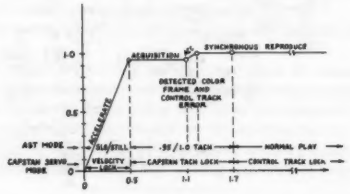
METHOD OF OPERATING A SIGNAL REPRODUCTION APPARATUS FOR EFFECTING SYNCHRONOUS REPRODUCTION OF RECORDED SIGNALS

Raymond F. Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 278,859, Jun. 29, 1981, abandoned, which is a division of Ser. No. 28,302, Apr. 9, 1979, Pat. No. 4,308,560, which is a division of Ser. No. 889,451, Mar. 23, 1978, Pat. No. 4,163,993. This application Jun. 30, 1983, Ser. No. 509,978

Int. Cl.³ H04N *9/44, 9/491*; G11B *21/10*

U.S. Cl. 358—324 **12 Claims**



1. A method of operating a signal recording and reproducing apparatus in a manner whereby generally continuously and noise-free transfers of color video signal information are provided while reproducing color video signal information from a magnetic tape and during the transition from a first mode wherein the tape is being transported at a speed substantially different than normal speed to a second mode wherein the tape is transported at normal speed in an apparatus of the type which has rotational means for scanning the magnetic tape along a plurality of adjacent discrete tracks, the rotation means including at least one movable means carrying transducing means, the movable means effecting movement of the transducing means in opposite directions relative to a nominal posi-

tion along a path generally transverse to the direction of the tracks in response to signals being applied thereto, the color video signal having luminanace, color subcarrier, horizontal line synchronizing, vertical field synchronizing and color burst synchronizing components, the method comprising the steps of:

generating positioning signals and applying the same to said movable means to have said transducing means accurately follow a subject track when said apparatus is operating in any one of said first and second modes and during the transition from the first to the second mode;

changing the speed at which said tape is being transported from said different speed to a predetermined speed between said different speed and said normal speed;

initially adjusting the head to track position relationship to effect a transitory condition of synchronous reproduction of the signal information with respect to a reference synchronizing signal when the speed of said tape reaches said predetermined speed, the condition of synchronous reproduction occurring when the head to track position relationship is maintained so that the color subcarier to vertical sync phase relationship corresponds to that of the reference synchronizing signal;

changing the speed of the tape from said predetermined speed to said normal speed;

maintaining the speed of said tape at the normal transport speed upon the tape reaching said normal transport speed;

detecting the reproduced signal information when the tape reaches the normal transport speed to indicate whether synchronous reproduction has been maintained; and

readjusting the head to track position relationship to effect synchronous reproduction of the signal information if the detecting step indicates synchronous reproduction has not been maintained.

4,494,154

PICKUP CONTROL DEVICE AND METHOD FOR FAST OR SLOW REPRODUCTION IN A DISK READING SYSTEM

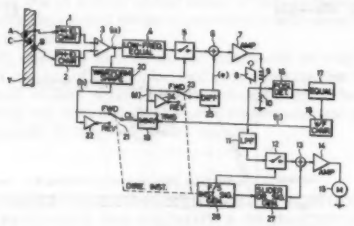
Toru Akiyama, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,221

Claims priority, application Japan, Aug. 4, 1980, 55-110414[U]

Int. Cl.³ G11B *7/00, 21/08, 21/10;* **H04N** *5/76*

U.S. Cl. 358—342 **2 Claims**



1. A pickup control for a data reading device comprising:

pickup means including a source of a first laser beam for reading data stored on a disk-shaped recording medium, a source of at least one second laser beam for detecting departure of said first laser beam from a center line of a track recorded on said disk-shaped recording medium, a slider means for moving radially between a circumferential edge and center of said disk-shaped recording medium said first and second laser beams, and a tracking mirror rotatably secured to said slider means for reflecting said first and second laser beams to a surface of said disk-shaped recording medium;

tracking servo means including a light sensor means which responds to a reflection of said second laser beam from said disk-shaped recording medium by outputting a tracking error signal corresponding to a direction and distance of departure of said first laser beam from said center line;

tracking mirror drive means for rotating said tracking mirror in response to said tracking error signal to cause said first laser beam to accurately track said center line;

slider drive means for moving radially said pickup means by said slider means in response to said tracking error signal to cause said first laser beam to accurately track said center line;

first switch means for disconnecting said tracking mirror drive means and said slider drive means from receiving said tracking error signal;

means for converting said tracking error signal into a position detecting signal which upon reaching a predetermined value triggers said first switch means to disconnect said tracking mirror drive means and said slider drive means from receiving said tracking error signal;

means for converting said position detecting signal into a first component of a differentiation output signal which when applied to said tracking mirror drive means for a predetermined time causes said tracking mirror to rotate toward a regular position at the middle of the arc along which said tracking mirror rotates in an opposite direction to which said tracking mirror is initially rotated in response to said tracking error signal;

means for providing said differential output signal to said tracking mirror drive means at the same time that said first switch means is triggered to prevent transmission of said tracking error signal to said tracking mirror drive means;

means for triggering said first switch means to restore transmission of said tracking error signal to said tracking mirror drive means following triggering to prevent said transmission when said first laser beam is accurately tracking said center line;

means for producing a braking second component of said differentiation output signal to said tracking mirror drive means to force said tracking mirror to cease rotating toward said regular position following said application of said first component when said first laser beam is accurately tracking said center line;

means for providing one of fast and slow reproduction signals to said slider drive means to appropriately change the relative position of said pickup means to said disk-shaped recording medium causing said first laser beam to depart from said center line; and

second switch means for disconnecting said slider means from receiving said tracking error signal when said one of fast and slow reproduction signals is provided to said slider drive means without interrupting transmission of said tracking error signals to said tracking mirror drive means and for reconnecting said slider drive means upon cessation of said one of fast and slow reproduction signals.

4,494,155

ADAPTIVE REDUNDANCE IN DATA RECORDING

Dominique H. Veillard, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,144

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—47 **18 Claims**

1. Apparatus for assuredly recording source data in a magnetic medium having surface defects therein that are, statistically, no greater than a given length and which are, statistically, separated by more than a certain distance, said data being formatted in segments that, as recorded in said magnetic medium at a nominal recording speed, have lengths that are no greater than the length of said certain distance, each said segment being comprised of said data formatted in blocks thereof, each said data block being of a length, as recorded in said magnetic medium, that is at least as great as said given length, and each said segment, further, having at least two less data

blocks per segment than said segment would otherwise be capable of containing, said apparatus comprising

(a) magnetic head means,

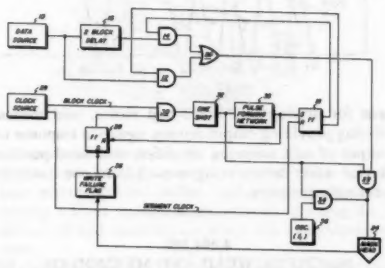
(b) means for producing a flag signal,

(c) a first data processing path for processing said data,

(d) a second data processing path for processing said data, said second data processing path having, in comparison to that of said first data processing path, means therein for delaying the feedthrough of data therein for a duration corresponding to the time between the start and end of at least two data blocks,

(e) means for producing a write failure signal signifying whether data has been recorded within said magnetic medium, and

(f) switching means cooperative with said means for producing a write failure signal



(1) for applying the data of said first data processing path to said magnetic head means in the absence of a write failure signal and

(2) for applying, in response to said write failure signal, said flag signal briefly to said magnetic head means, and thereafter applying the data of said second data processing path to said magnetic head means,

whereby, during playback of the data so recorded in said magnetic medium, the format of the data processed by either or both said data processing paths may be reconstituted, said played-back flag signal serving to signify that the recorded data of the data block just preceding the played-back flag signal is defective, but that correct data may be found in the recorded block just following such flag signal.

4,494,156

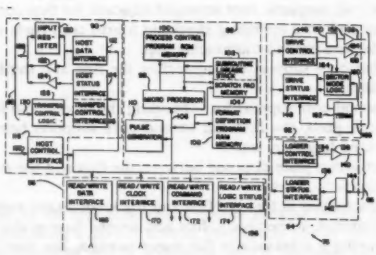
SELECTABLE FORMAT COMPUTER DISK COPIER MACHINE

Eric M. Kadison; Subhash C. Batra, both of Mission Viejo, and Gad E. Meir, San Jose, all of Calif., assignors to Media Systems Technology, Irvine, Calif.

Filed May 14, 1982, Ser. No. 378,484

Int. Cl.³ G11B *5/09, 5/86*

U.S. Cl. 360—48 **8 Claims**



1. A selectable format disk drive controller for controlling the operation of a computer disk drive in reading and writing operations, said controller comprising:

means for process control program storage for permanently storing a process control program;

means for format definition program storage for storing a format definition program so that the contents of said format definition program may be changed in order to select the format for use with said disk drive; and

means for processing connected to both said means for program storage so that steps of said process control program may be executed to use steps of said format definition program in order to control the operation of said disk drive in reading and writing operations.

4,494,157

INFORMATION READOUT APPARATUS

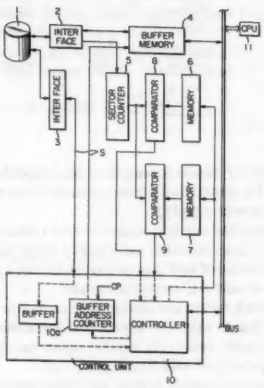
Kenzo Ina, and Teruya Hara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,568

Claims priority, application Japan, Aug. 21, 1981, 56-130205

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—48 **5 Claims**



1. An information readout apparatus operable with a magnetic disc having a plurality of sectors, comprising:

means for reading data from the magnetic disc;

memory means for storing data read from the magnetic disc; and

control means for writing the data read from the magnetic disc in said memory means in a predetermined sequence when a current sector being read from said magnetic disc is between a start address and an end address thereon, and for reading the written data from said memory means in a different sequence from the writing sequence as required.

4,494,158

MUTING APPARATUS

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,885

Claims priority, application Japan, Mar. 10, 1981, 56-34297

Int. Cl.³ G11B *15/18*

U.S. Cl. 360—69 **6 Claims**

1. An electronic apparatus having an alarm function for indicating a prescribed mode, comprising:

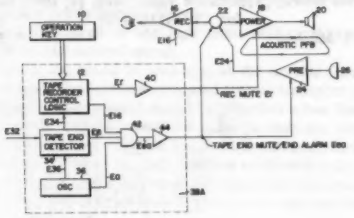
first means arranged to detect said prescribed mode, for supplying a first signal indicative of said prescribed mode on a single signal line, said first signal having a given potential before the detection of said prescribed mode and

wherein said first signal includes an AC component after the detection of said prescribed mode;

second means responsive to said first signal, for generating a second signal when said first signal is at said given potential wherein said second signal is generated in the absence of said prescribed mode;

third means coupled to said single signal line, for generating an alarm sound corresponding to the AC component of said first signal when said first signal includes said AC component, said third means being arranged in acoustic feedback loop relation with respect to said second means wherein howling is produced when an output from said third means is processed by said second means; and

said second means including fourth means coupled to said single signal line, for causing said acoustic feedback loop to be cut off when said first signal on said signal line includes said AC component, so that the howling otherwise caused by the formation of said acoustic feedback loop is suppressed, said fourth means including:



resistor means arranged to be coupled to a power supply, for generating a bias potential from the potential of said power supply;

capacitor means coupled to said resistor means, to provide a time constant sufficiently large to retard a rapid increase of said bias potential during a period of repetition of said AC component; and

switch means coupled to said capacitor means and responsive to said first signal, for decreasing said bias potential relatively rapidly upon receipt of the AC component of said first signal; and

said second means further including amplifier means responsive to said bias potential from said resistor means, for generating said second signal, said amplifier means being disabled from generating said second signal when said switch means receives said AC component and said bias potential is fixed under a certain decreased value.

4,494,159

MAGNETIC HEAD-POSITIONING DEVICE FOR MAGNETIC DISC DRIVE

Chitoshi Takayama; Hideo Hirao; Hideya Yokouchi, and Teruhiko Iida, all of Nagano, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Takaji Kogya Kabushiki Kaisha, Nagano, both of, Japan

Filed Oct. 5, 1982, Ser. No. 432,885

Claims priority, application Japan, Oct. 9, 1981, 56-161583

Int. Cl.³ G11B *5/55*

U.S. Cl. 360—78 **17 Claims**

1. A magnetic head-positioning device for a magnetic disc drive, comprising:

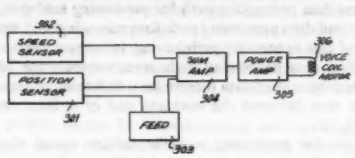
a voice coil motor for transferring a magnetic head to a predetermined track position to stop there;

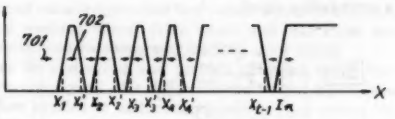
a position sensor for detecting the track position and a median position between a track and an adjacent track;

a feed circuit for transferring said magnetic head to an adjacent track position by accelerating said voice coil motor to said median position between said track and said adjacent track;

a speed sensor for detecting the speed of said voice coil motor;

a summing amplifier for summing outputs of said position sensor, said feed circuit and speed sensor; and





means for driving said voice coil motor, said means for driving providing output driving signals in response to the output of said summing amplifier, said head-positioning device when driven being moved from one track to the next adjacent track.

4,494,160

MAGNETIC HEAD AND METHOD OF MANUFACTURING A MAGNETIC HEAD

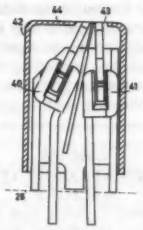
Jan Bakker, Heerlen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,618

Claims priority, application Netherlands, Dec. 11, 1980, 8006715

Int. Cl.³ G11B *5/22, 5/10, 5/11, 5/12*

U.S. Cl. 360—129 **1 Claim**



1. A multitrack magnetic head which comprises:

a first magnetic core, the first cone including first and second core parts which define a first transducing gap;

a second magnetic core arranged adjacent the first core, the second core including third and fourth core parts which define a second transducing gap;

a first core support for supporting the first and third core parts;

a second core support for supporting the second and fourth core parts, the first and second core supports being secured together, and

a screening plate disposed between the first and the second magnetic cores,

characterized in that the first and the second core supports comprise, respectively, first and second base plates each having a substantially flat major portion, the core parts being secured to the major portions of the respective base plates, and that the screening plate is secured directly to

the major portions of the first and the second base plates so that the supports are secured together by the plate.

4,494,161

TAPE CASSETTE

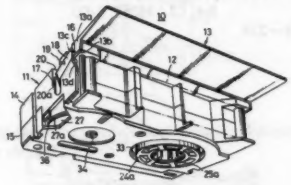
Haruki Ogata, Sagamihara; Kimio Ogawa, and Hiroyuki Umeda, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 15, 1982, Ser. No. 339,675

Claims priority, application Japan, Jan. 20, 1981, 56-7566

Int. Cl.³ G11B *23/08, 15/66*

U.S. Cl. 360—132 **5 Claims**



1. A tape cassette comprising:

a cassette case having top and bottom surfaces;

a tape accommodated within said cassete case, said tape having a front tape path part extending along the front surface of said cassette case when said tape cassette is not used;

a lid pivotally supported to rotate around a pair of stationary pivots in a vicinity of a corner part of said cassette case, said lid being rotatable between an open state and a closed state, in said open state said lid being positioned approximately in a plane including the top surface or the bottom surface of the cassette case, in said closed state said lid covering the tape at said front tape path part; and

positioning means for urging said lid to move in a lid opening direction when said lid is opened to a rotational position exceeding an intermediate point of rotation and for urging said lid to move in a lid closing direction when said lid is closed to a rotational position exceeding the intermediate point of the rotation, so that said lid is maintained in the open state and the closed state, respectively.

4,494,162

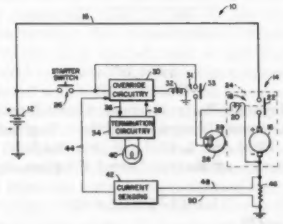
STARTER THERMAL OVERLOAD PROTECTION SYSTEM

Francis R. Eyler, Hanover, Pa., assignor to Harsco Corporation, Harrisburg, Pa.

Filed Oct. 30, 1981, Ser. No. 316,640

Int. Cl.³ H02H *5/04*

U.S. Cl. 361—29 **2 Claims**



1. In an internal combustion engine starting system of the type including a power source, an electric starter including motor windings within a housing, and a manually operable starter switch for selectively energizing the starter from the power source, a device for protecting the electric starter from overheating during extended cranking periods, said device comprising:

override circuitry electrically interposed between the starter switch and the starter, said override circuitry arranged to limit energization of the starter and consequent engine cranking to a predetermined timing sequence of alternating ON intervals and OFF intervals even though the operator continuously operates the starter switch, the predetermined timing sequence being selected so as to allow sufficient time for motor winding heat to dissipate into the starter housing to prevent excessive winding temperatures, and current sensing circuitry for sensing current drawn by the electric starter and for modifying the ON to OFF time ratio of said override circuitry as an inverse function of sensed starter current.

4,494,163

ELECTRIC SWITCHING SURGE PROTECTION

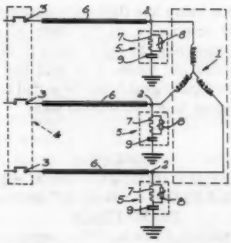
Christopher P. Yelland, Montroux, and Rapha E. Pretorius, Pretoria, both of South Africa, assignors to Yelland Engineering (Proprietary) Ltd., South Africa

Filed Aug. 2, 1982, Ser. No. 404,296

Claims priority, application South Africa, Aug. 4, 1981, 81/5341

Int. Cl.³ H02H *1/04, 9/04*

U.S. Cl. 361—56 **20 Claims**



1. An electric surge protector for use in a switch controlled, AC electric load circuit which is operable at a voltage of at least 1 kV and which comprises a load and a load cable connecting the load to switch means, the electric surge protector comprising:

an RC network connectable between earth and a phase of the load circuit, the RC network comprising:

a linear cable terminating resistance component having a substantially linear V-I characteristic;

a non-linear resistance component connected in parallel with the linear resistance component and having a predetermined knee-point voltage value; and

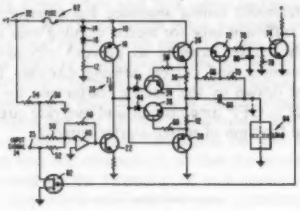
a capacitance component connected in series with the parallel connected linear and non-linear resistance components, the capacitance component being operative to decouple the resistance components at least partially from the circuit at power supply frequency but to couple the combined resistive impedance of the parallel connected linear and non-linear resistance components effectively into the circuit at frequencies associated with wavefront rise times of up to 2.0 microseconds and the capacitance component further being operative to increase the rise time of that portion of a steep fronted surge which exceeds the knee-point voltage value of the non-linear resistance component.

4,494,164

OVERLOAD PROTECTION DEVICE

Stan L. Noel, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,729
Int. Cl.³ H02H 9/02
U.S. Cl. 361—101 11 Claims



1. Apparatus for sensing and limiting a. c. current to a reactive load from a signal source receiving an input signal comprising:

reactive impedance means for coupling a. c. current from the signal source to the reactive load, wherein a potential difference is developed across said reactive impedance means in response to said a. c. current;

switching means, responsive to the potential difference across said reactive impedance means, for switching from a first state to a second state in response to the potential difference being in excess of a preselected amount, and switching back to said first state in response to the potential difference being less than said preselected amount;

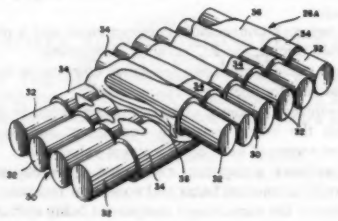
control means responsive to the state of said switching means for connecting the input signal to the signal source when the switching means is in said first state, and for removing the input signal from the signal source when the switching means is in said second state.

4,494,165

FILAMENT COMPOSITE STRUCTURES PROVIDING LIGHTNING STRIKE AND ELECTROMAGNETIC PROTECTION

Mahendra Maheshwari, Lincoln, Nebr., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 13, 1980, Ser. No. 206,479
Int. Cl.³ H02G 15/08; H05F 1/02
U.S. Cl. 361—117 19 Claims



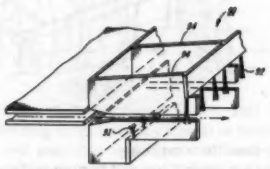
1. A single, fully integrated laminated structure providing protection against lightning strike damage and electromagnetic interference, said structure comprising a lower area fabricated of filament composite material and only a surface area fabricated entirely of metallic-coated filaments, both areas and each area with the other being intermixed with epoxy resin, said structure being integrally formed in one piece by simultaneous curing of the whole integrated structure, said surface area providing a conductive barrier to disperse the current from lightning strike and electromagnetic sources.

4,494,166

PRINTING MACHINE WITH STATIC ELIMINATION SYSTEM

Philip A. Billings, Fairport, and William S. Franks, Jr., Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 421,000
Int. Cl.³ H05F 3/00
U.S. Cl. 361—214 1 Claim



1. A printing machine for producing copies from page images, comprising in combination:

printing means for printing said page images on copy sheets;

input means for feeding copy sheets toward said printing means;

output means for receiving said copy sheets after page images have been applied thereto by said printing means;

paper path means for channeling copy sheets from said input means to said output means; and

static eliminator means positioned within said paper path for discharging static electricity from sheets passing through said paper path to a predetermined level, said static eliminator means including at least first and second carbon fiber brushes with said first carbon fiber brush located in a noncontacting position below the sheets and said second carbon fiber brush located above the sheets in a contacting position downstream from said first carbon brush, and wherein said first and second carbon fiber brushes are mounted in a plastic baffle assembly having a major portion of its area open with respect to sheets passing therethrough and ribs that serve as the sole support for the sheets, said first and second carbon fiber brushes having a major portion of their fibers positioned within the open area and between the ribs of said baffle assembly.

4,494,167

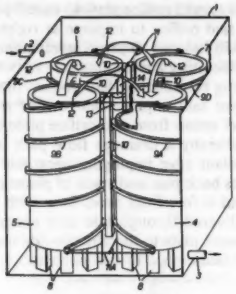
INDUCTOR

Robert B. Molyneux-Berry, Danbury, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Apr. 2, 1982, Ser. No. 364,965
Claims priority, application United Kingdom, Apr. 3, 1981, 8110602
Int. Cl.³ H01H 9/22
U.S. Cl. 361—270 19 Claims

1. An inductor arranged within a conductive enclosure, comprising: two equal coils wound in opposite directions and positioned adjacent each other, the coils having axes that are substantially parallel and having adjacent ends that are connected directly together so that the coils are connected electrically in parallel, the coils being mounted in the enclosure so

that the lines of magnetic force produced when the coils are energized form closed loops which link both coils without the agency of magnetic materials and which substantially avoid intersecting the walls of the enclosure.



4,494,168

ROLL TYPE CAPACITOR HAVING SEGMENTED METALLIZED AREAS

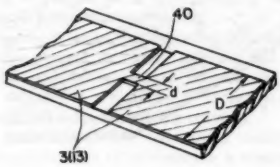
Nobuyuki Kume; Harumi Yoshino, both of Matsue, and Miyuki Nagaoka, Hirata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Jan. 6, 1982, Ser. No. 337,400

Claims priority, application Japan, Jan. 7, 1981, 56-1525; Jan. 7, 1981, 56-1527

Int. Cl.³ H01G *1/017, 1/015*

U.S. Cl. 361—273 **10 Claims**



1. A metallized capacitor having a pair of electrodes, comprising, a pair of first and second laminated dielectric films convolutely wound into a roll, a plurality of first metallized areas on said first dielectric film, a plurality of second metallized areas on said second dielectric film, said first and second metallized areas being longitudinally spaced apart by separations of 0.1 mm to 5.0 mm, the interval between successive ones of said separations being 10 mm to 500 mm, said first dielectric film having a first non-metallized longitudinal marginal area on one edge thereof, said second dielectric film having a second non-metallized longitudinal marginal area on one edge thereof which is opposite to the first non-metallized marginal area, said first metallized areas extending transversely from said first non-metallized marginal area to the opposite edge of the first dielectric film so that it can be connected to one of said electrodes, said second metallized areas extending transversely from said second non-metallized marginal area to the opposite edge of the second dielectric film so that it can be connected to the other electrode, means provided on the opposite ends of said roll for electrically connecting the first and second metallized areas in parallel relationship to said electrodes, respectively, an electrically resistive region in each of said separations, said resistive region being formed by a metallized portion connected between adjacent metallized areas, said metallized portion having a transverse dimension smaller than one-tenth of the transverse dimension of the metallized areas.

4,494,169

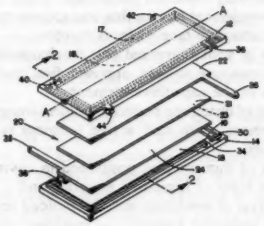
DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

William A. Watson, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,466

Int. Cl.³ H01G *1/14, 7/00, 9/00*

U.S. Cl. 361—306 **53 Claims**



1. A capacitor including:

a first molded housing segment;

a first border segment around the periphery of said first molded housing segment;

a second molded housing segment;

a second border segment around the periphery of said second molded housing segment;

said first and second border segments being in facing and abutting contact and being bonded together;

a recess in at least one of said molded housing segments;

said first and second molded housing segments cooperating to define within said border segments an interior cavity having opposed first and second face surfaces, said first face surface being on said first molded housing segment and said second face surface being on said second molded housing segment;

first electrically conductive means associated with said first face surface;

second electrically conductive means associated with said second face surface;

a flat dielectric element in said cavity, said dielectric element having first and second opposed faces, with a first electrically conductive layer on said first face and a second electrically conductive layer on said second face;

said first electrically conductive means being physically and electrically connected to at least part of said first electrically conductive layer and said second electrically conductive layer and said second electrically conductive means being connected to at least part of said second electrically conductive layer;

said first electrically conductive means including a first terminal pin extending therefrom;

said second electrically conductive means including a second terminal pin extending therefrom;

moisture barrier means in said first and second border segments; and

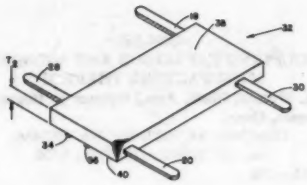
passage means in at least one of said border segments for passage of said first and second terminal pins.

4,494,170

DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Donald P. Schilling, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,469
Int. Cl.³ H01G 1/14, 7/00/9/00
U.S. Cl. 361—306 **11 Claims**



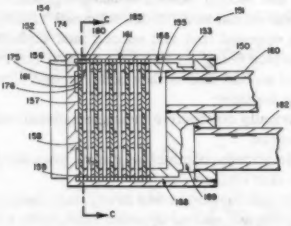
7. A decoupling capacitor including:
- a capacitive element having first and second opposed electrically conductive face surfaces thereon;
- a plurality of active terminal pins mechanically and electrically connected to said opposed first and second face surfaces of the capacitive element;
- a first layer of insulating material molded around said capacitive element, with said active terminal pins projecting therefrom;
- a plurality of dummy pins positioned in cavities formed in said first layer of insulating material; and
- a second layer of insulating material molded around said first layer of insulating material and mechanically locking said dummy pins in position.

4,494,171

IMPINGEMENT COOLING APPARATUS FOR HEAT LIBERATING DEVICE

Timothy J. Bland, and Richard E. Niggemann, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 24, 1982, Ser. No. 411,059
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 **33 Claims**



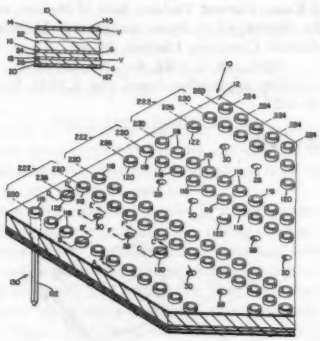
1. An impingement cooli..g apparatus including a heat liberating device, the impingement cooling apparatus including in combination:
- a housing having an end of said housing in intimate contact with said device,
- a stack of plates fitted within and parallel to said housing end, one of said plates being an impingement orifice plate adjacent said end of said housing where said device is located, said orifice plate having impingement orifice regions characterized by coolant flow impingement orifices passing therethrough, said orifice plate having coolant drainage return means adjacent said impingement orifice regions,
- the remaining plates positioned adjacent said orifice plate and between said orifice plate and a coolant inlet means and a drainage means, each of said plates having at least one opening therethrough, each said opening cooperating with the opening on an adjacent plate to form an inlet channel means between said coolant inlet means and said orifice plate to thereby allow the establishment of a coolant flow path to said orifice plate to thereby supply coolant through said orifice to impinge at right angles upon said end of said housing to provide impingement cooling of said heat liberating device,
- said coolant being returned via said coolant drainage return means adjacent said impingement orifice regions and a return channel means from said orifice plate to said drainage means whereby a drainage flow path is established such that coolant after impinging upon said end of said housing passes back past said stack of plates to said drainage means and is free from cross-flow with said coolant flow path delivered through said inlet channel means to said impingement plate to thereby provide maximum heat transfer from said device to said coolant.

4,494,172

HIGH-SPEED WIRE WRAP BOARD

Burton Leary, Hingham, and Shaun Silverio, Beverly, both of Mass., assignors to Mupac Corporation, Brockton, Mass.

Filed Jan. 28, 1982, Ser. No. 343,576
Int. Cl.³ H05K 1/02
U.S. Cl. 361—400 **22 Claims**



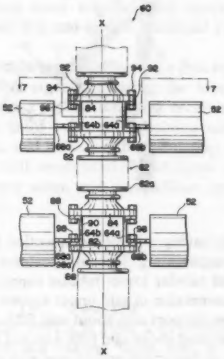
1. A multilayer panel board comprising
- a first electrically conductive layer extending across said board for carrying a first voltage to a plurality of points across said board,
- second and third electrically conductive layers for carrying a second voltage different from said first voltage, said first conductive layer being positioned between said second and third conductive layers,
- first and second electrically insulative layers separating said first conductive layer respectively from said second and third conductive layers by a distances small enough to produce a large distributed capacitance between said first conductive layer and said second and third conductive layers,
- a fourth electrically conductive layer extending across said board for carrying said first voltage, said fourth conductive layer being positioned on the other side of said second conductive layer from said first conductive layer.
- a third electrically insulative layer separating said fourth conductive layer from said second conductive layer, and
- a plurality of electrical connections between said first and fourth conductive layers, and between said second and third conductive layers, said electrical connections being distributed regularly across said board, for increasing the current carrying capacity of, and for enhancing the uniformity of said first and second voltages across, said board.

4,494,173

THREE-DIMENSIONAL INSULATING STRUCTURE FOR HIGH VOLTAGE COMPONENTS

Hiroo Ikekame, and Yasuo Karasawa, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 16, 1982, Ser. No. 418,607
Claims priority, application Japan, Sep. 26, 1981, 56-151368
Int. Cl.³ H02B 1/04
U.S. Cl. 361—429 3 Claims



1. A high voltage apparatus with a three-dimensional structure comprising:

a plurality of electric units, each having a first horizontal lead and a second horizontal lead;

a frame having at least a first insulating column and a second insulating column vertically oriented and horizontally spaced from said first insulating column, said electric units being mounted in a plurality of vertical stages between said first and second insulating columns;

wherein each of said first and second insulating columns includes a plurality of insulators in a substantially vertically linear arrangement at intervals each including an upper flat flange and a lower flat flange placed substantially parallel to said upper flange,

a plurality of pairs of metallic spacers, each pair of said metallic spacers being arranged between said each of said plurality of insulators to couple each of said plurality of insulators thereby to form each of said first and second insulating columns, and including a first metallic spacer and a second metallic spacer arranged at a distance from and insulated from said first metallic spacer, each of said first and second metallic spacers including an upper wall, a lower wall placed substantially parallel to said upper wall and a side wall coupling said upper and lower walls at both ends thereof, and

connecting means for connecting said upper and lower walls to said lower and upper flat flanges respectively and for attaching said electric units to said lower wall of said first and second metallic spacers;

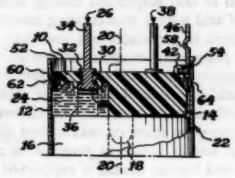
wherein each of said electric units is mounted substantially horizontally bewtween said first and second insulating columns such that said first horizontal lead of each of said electric units is mounted on each of said first metallic spacers of said first insulating column and said second horizontal lead of each of said electric unit is mounted on each of said second metallic spacers of said second insulating column.

4,494,174

WET-ELECTROLYTE CAPACITOR PACKAGE

Walter W. Schroeder, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 27, 1982, Ser. No. 424,808
Int. Cl.³ H01G 9/00; H05K 1/14
U.S. Cl. 361—433 6 Claims



1. A wet-electrolyte capacitor package for mounting to a printed circuit board comprising:

a cylindrical metal cam having one open end;

a wet electrolyte combined within said can;

an anodized film-forming anode covered by said electrolyte;

a plastic cover of disk shape being fitted within the open end of said can;

a seal between the periphery of said cover and can;

a metal terminal being sealed in a hole provided therefor in said cover, said terminal having a lead portion extending away and in an axial direction with respect to said can, said anode being electrically connected to said terminal;

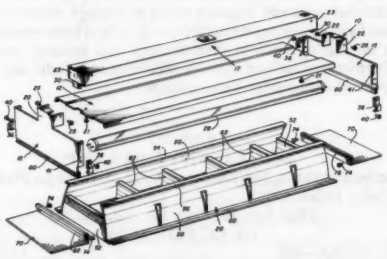
at least three separate elongate metal pieces being affixed at separate locations to the inner lip of said can and extending in an axial direction away from said cover to serve as a means for said mounting, each of said separate elongate metal pieces having a foot portion that is bent radially inward and at right angles to said axial direction, each one of said foot portions being snugly fitted into an outward and radially facing cavity provided therefor in said cover near said cover periphery.

4,494,175

RECESSED LIGHTING FIXTURE WITH IMPROVED LOUVER MOUNTING

Mahmoud A. Gawad, Montreal, and John Graudins, St-Laurent, both of Canada, assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 9, 1984, Ser. No. 569,002
Int. Cl.³ F21S 1/02
U.S. Cl. 362—150 14 Claims



1. A recessed lighting fixture adapted for use in association with a suspended ceiling structure having a grid support comprised of spacedly positioned grid members, said lighting fixture comprising a fixture housing having means at the top thereof for supporting a pair of spaced lamp socket members, said housing open at the bottom thereof, a relatively thin, deflectable top plate member secured to said housing or form-

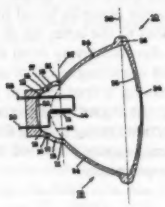
ing a part thereof and defining an optically reflecting surface disposed adjacent said lamp socket members, means securing said fixture housing to said grid support between said spacedly positioned grid members, and louver means having a top portion adapted to contact said deflectable top plate member and a bottom portion including longitudinally extending sides for resting upon and being supported by a respective one of said spacedly positioned grid members, said louver means not fixedly attached to said suspended ceiling structure, said bottom portions of said louver means being insertable on each of said grid members in sequence, one and then the other, said deflectable top plate member deflecting upwardly in a pivotal manner upon said contact with said top portion of said louver means during said insertion of said louver means on said grid members to facilitate said insertion and thereafter exerting a substantially downward force on said louver means to assist in maintaining said louver means in position on said grid members, whereby said louver means is supported in said fixture housing without the use of supporting springs, latches or the like.

4,494,176

LAMPS HAVING MULTIPLE AND AIMED PARABOLIC SECTIONS FOR INCREASED USEFUL LIGHT OUTPUT

Robert W. Sands, Hudson; Joseph P. Marella, Chardon, and Thomas F. Fink, Jr., Macedonia, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,903
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—297 **14 Claims**



1. A reflector lamp comprising a concave reflector and a finite light source having its geometric center located approximately at the focal point of the concave reflector, said concave reflector comprising a primary parabolic reflective section and at least first and second additional parabolic sections, said first and second additional parabolic sections being reflective and having a substantially common focal point confocal with the focal point of said concave reflector, said first and second additional parabolic sections being so aligned relative to said finite light source as to be effective to reflect light rays impinging on the surfaces to thereof onto said primary parabolic reflective section and thereby directing said light rays in an improved columnated beam pattern.

4,494,177

ARTICULATED TASK LAMP

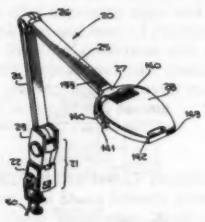
Charles Matthews, San Clemente, Calif., assignor to Plan Hold Corp., Irvine, Calif.

Filed Apr. 20, 1983, Ser. No. 486,741
Int. Cl.³ F21V *21/18*
U.S. Cl. 362—402 **11 Claims**

1. Counterbalanced support means for a drafting table lamp in which a base means is provided with a lower base portion adapted to be clamped to a drafting table and with an upper base portion pivoted on the lower base portion about first and second axes, counterbalance means in the upper base portion including a crank member pivoted about a third axis transverse to one of the first and second torsion axes, a torsion spring means biasing said crank member, a thrust link member connected to one end of the crank member, a lower tubular support arm pivotally mounted on the upper base portion about a fourth axis, and an upper support arm pivotally connected about a fifth axis to the lower support arm and carrying a lamp provided with a pivotal connection to the upper support arm, comprising in combination:

a compensating link in said upper base portion having a pivotal connection at one end to one end of said thrust link member;

said compensating link having a pivotal connection between its ends to said upper base portion;



a link member having a pivotal connection to the other end of said compensating link and extending within and through said tubular lower tubular support arm;

said pivotal connection of said upper support arm to the end of said lower support arm about said fifth axis comprising;

a crank arm pivoted about said fifth axis and having a pivotal connection to the upper end of said link member;

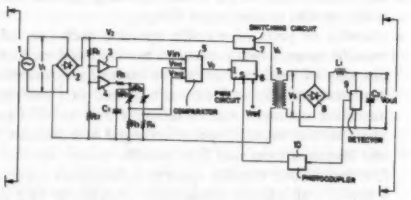
said crank arm having a driving connection acting about said fifth axis to the upper support arm for transmitting counterbalancing forces from the torsion spring means through the compensating link, and link member to the upper support arm.

4,494,178

POWER SUPPLY CIRCUIT

Kazumi Ishima, Kashiwa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 17, 1982, Ser. No. 442,266
Claims priority, application Japan, Nov. 19, 1981, 56-185696
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **18 Claims**



1. A power supply circuit for converting an a.c. input voltage into a d.c. output voltage comprising:

first rectifying means which receives said a.c. input voltage and supplies across its first and second outputs a first rectified voltage rectified from said a.c. input voltage;

a transformer having a primary winding and a secondary winding;

switching means connected between the first output of said first rectifying means and one end of the primary winding the other end of which is connected to the second output of said first rectifying means;

second rectifying means connected to receive the voltage induced across the secondary winding of said transformer

for supplying across its first and second outputs a second rectified voltage;

first filter means for filtering said second rectified voltage to generate said d.c. output voltage;

level-shift means connected to receive said first rectified voltage for producing a varying voltage which is proportional to said first rectified voltage, a first threshold voltage and a second threshold voltage which is lower in level than said first threshold voltage;

comparator means connected to receive said varying voltage and said first and second threshold voltages for supplying a comparator output signal which is either high or low depending upon whether said varying voltage is inbetween said first and second threshold voltages or not; and

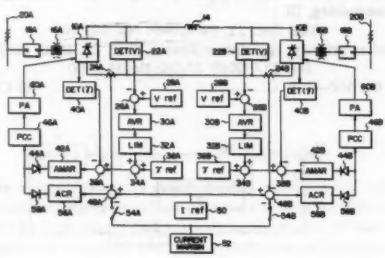
pulse width modulating means having a first input for receiving a detecting signal indicating the level of said d.c. output voltage, a second input for receiving a reference signal and a third input for receiving said comparator output signal, said pulse width modulating means supplying a pulse width modulated output signal to said switching means only when said comparator output signal received is high.

4,494,179

CONTROL DEVICE FOR A CONVERTER

Haruhisa Inokuchi, and Takami Sakai, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 7, 1983, Ser. No. 464,695
Claims priority, application Japan, Feb. 26, 1982, 57-29902
Int. Cl.³ H02J 3/36
U.S. Cl. 363—35 **4 Claims**



1. A control device for a converter used in a DC transmission system, comprising:

automatic voltage regulator means for generating a first control angle signal to keep DC voltage of said DC transmission system constant;

automatic margin-angle regulator means for generating a second control angle signal for making a margin-angle of the converter equal to a margin-angle predetermined by said first control angle signal from said automatic voltage regulator means;

automatic current regulator means for generating a third control angle signal for keeping DC current flowing through said DC transmission system constant; and

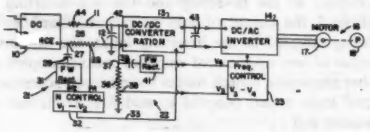
switch circuit means for supplying said second control angle signal from said automatic margin-angle regulator means to the converter when the converter functions as an inverter and supplying said third control angle signal from said automatic current regulator means to the converter when the converter functions as a rectifier.

4,494,180

ELECTRICAL POWER MATCHING SYSTEM

August L. Streater, Bluffton, and Daniel T. Dwyer, Fort Wayne, both of Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Dec. 2, 1983, Ser. No. 557,070
Int. Cl.³ H02M 5/45
U.S. Cl. 363—37 **20 Claims**



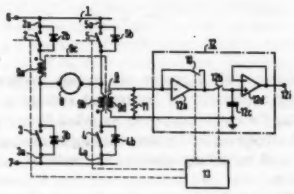
1. Apparatus for operating a system at the maximum power transfer point, the system including an adjustable load, a direct current power source that has a nonlinear voltage-current characteristic and lines connecting the load to the source, said apparatus comprising first means adapted to be connected to said lines for producing a relatively small change in the current in said source and said lines, second means adapted to be connected to said lines for sensing the source DC current and said change in current, third means adapted to be connected across said source and sense said source DC voltage and the change in voltage caused by said change in current, and fourth means connected to said second and third means and adapted to be connected to said adjustable load to vary said load to maintain the relation $V/I = -\Delta V/\Delta I$, where V and I are the direct current voltage and current of the source, and ΔV and ΔI are the changes in the voltage and current.

4,494,181

CIRCUIT ARRANGEMENT FOR DETERMINING THE POLARITY AND MAGNITUDE OF THE LOAD CURRENT IN A REVERSIBLE D-C CONTROLLER OR CHOPPER

Franz Ramlohr; Werner Pohl, and Walter Kölzer, all of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,757
Claims priority, application Austria, Dec. 21, 1981, 5488/81
Int. Cl.³ H02M 7/02
U.S. Cl. 363—63 **7 Claims**



1. In a circuit arrangement for determining the polarity of the load current in a reversible d-c controller having a bridge circuit which is connected across a d-c supply voltage source, said bridge circuit having four bridge arms, respective pairs of said bridge arms being diagonally disposed in said bridge circuit, load current flowing to or from the d-c supply voltage source through the diagonally disposed bridge arms, each of said bridge arms including an antiparallel circuit comprising first electronic switch means and bypass diode means wherein two pairs of bridge arms respectively connected to the same bus of said supply voltage source each form a bypass circuit in which a measuring sensor is provided, said first electronic switch means controlled so that the load current circulates in

successive time intervals in alternating fashion in the two bypass circuits, the improvement comprising:

a current transformer having two primary windings provided as measuring sensors, said primary windings connected in opposite winding sense in respective ones of said bypass circuits in two of said diagonally disposed bridge arms, said current transformer having a secondary winding connected across a load resistor;

operational amplifier means having said secondary winding coupled to the inverting and the non-inverting inputs thereof, the output of said operational amplifier means being coupled to the inverting input, the non-inverting input of said operational amplifier means coupled to further electronic switch means to reference potential;

digital logic means coupled to said first electronic switch means; and

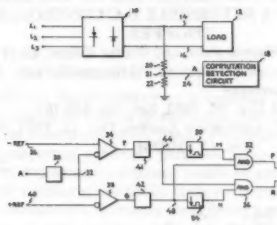
said further electronic switch means controlled by said digital logic means in dependence on the control signals from said first electronic switch means so that said further electronic switch means causes said operational amplifier means to operate as an inverting amplifier in every time interval in which the load current circulates in the same predetermined bypass circuit.

4,494,182

COMMUTATION DETECTION APPARATUS AND METHOD

William D. Brackman, Jr., Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Jan. 14, 1983, Ser. No. 458,109
Int. Cl.³ H02M *1/08*
U.S. Cl. 363—63 **8 Claims**



1. For use with a power conversion system of the type employing a plurality of controlled switching elements for controlling the electrical power supplied from a power source to a load, circuit means for determining an instant in time when each of said switching devices is rendered non-conductive comprising:

means to provide a first signal indicative of the instantaneous voltage supplied to said load from said source;

(b) means responsive to said first signal to produce a second signal proportional to the derivative, with respect to time, of the said first signal;

(c) means to provide first and second reference signals;

(d) first and second comparator means responsive to said second signal and, respectively, to said first and second reference signals to selectively provide first and second output signals indicative of prescribed changes in said second signal; and,

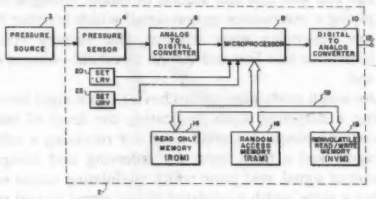
(e) logic means responsive to said first and second output signals to provide a final output signal indicating said instant in time.

4,494,183

PROCESS VARIABLE TRANSMITTER HAVING A NON-INTERACTING OPERATING RANGE ADJUSTMENT

Stephen J. Bayer, Fitzwatertown, and Arthur M. Olsen, Pennsburg, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 17, 1982, Ser. No. 389,633
Int. Cl.³ G06F *15/20*; G01R *35/00*
U.S. Cl. 364—154 **8 Claims**



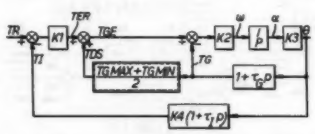
5. A method of changing the range of a process variable transmitter having a computing means for computing a transmitter output signal including the steps of applying a first predetermined process variable input to said computing means, applying a first control signal to said computing means to produce a first transmitter output signal as a lower range value, applying a second process variable input to said computing means, and applying a second control signal to said computing means to produce a second transmitter output signal as an upper range value by calculating the difference between the lower and upper range values.

4,494,184

PROCESS AND DEVICE FOR SERVO-CONTROL

Philippe Crevel, Angers, France, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1981, Ser. No. 333,498
Claims priority, application France, Dec. 22, 1980, 80 27232
Int. Cl.³ G06F *15/20*; B60H *3/00*
U.S. Cl. 364—178 **13 Claims**



1. Device for servo-controlling a first magnitude TI depending on at least one controllable parameter θ, said device comprising:

a first sensor means for furnishing a measuring signal representative of said first magnitude TI;

a second sensor means for furnishing a measuring signal representative of a second magnitude TG which varies as a function of said parameter θ;

an adjusting member for furnishing a reference signal representative of a reference value TR;

means for servo-controlling the value of said parameter θ and varying the second magnitude TG;

means for calculating a value TGE by which said second magnitude TG must be servo-controlled;

control means acting on said means for servo-controlling to vary said second magnitude TG by said calculated value;

said means for calculating comprising: means for monitoring variations in time of said second magnitude TG; means for determining both a maximum value TGEMX and a minimum value TGEMIN of said second magnitude TG,

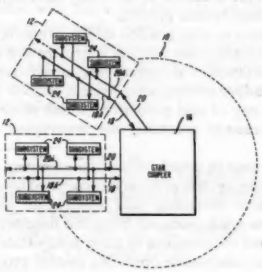
during previous n half-period time variation of the second magnitude TG, n being a whole number; means for calculating a value TER as a function of the deviation between the reference value TR and the first magnitude TI, and calculating a value TDS equal to the arithmetic mean between said previously determined maximum value TGEMX and said minimum value TGEMIN of the second magnitude TG; and means for providing the value TGE as being equal to TDS+TER.

4,494,185

DATA PROCESSING SYSTEM EMPLOYING BROADCAST PACKET SWITCHING

Robert O. Gunderson, Poway; James C. Kocol, and David B. Schuck, both of Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 16, 1981, Ser. No. 254,850
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **20 Claims**



1. In a data processing system having a plurality of subsystems and employing broadcast packet switching for delivering a message from one of said subsystems to another of said subsystems over a system bus, said system bus including a star coupler and pairs of first and second transmission lines, with said pairs of transmission lines linked by said star coupler so that a message from one of said subsystems may be carried along said first transmission line in one of said pairs of transmission lines to said star coupler and passed through said star coupler to said second transmission line in all of said pairs of transmission lines, the improvement wherein:

plural subsystems are each separately connected along at least one of said pairs of transmission lines so that said first transmission line in that one of said pairs carries signals transmitted by any one of its connected subsystems to said star coupler and said second transmission line in that one of said pairs carries signals to be received at all of its connected subsystems, and so that the number of subsystems in said data processing system is greater than the number of pairs of transmission lines linked by said star coupler; and

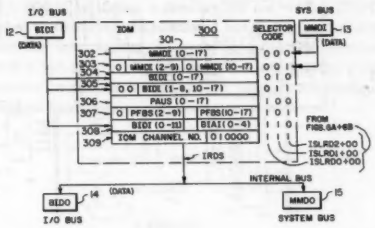
each of said connected subsystems comprises a processor and a local memory each operatively connected to said one of said pairs of transmission lines, said local memory for storing data to be processed by said processor.

4,494,186

AUTOMATIC DATA STEERING AND DATA FORMATTING MECHANISM

Gary J. Goss, Acton, Mass.; Richard P. Kelly, and Thomas L. Murray, Jr., both of Nashua, N.H., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 059,316, Jul. 20, 1979, , which is a continuation of Ser. No. 741,009, Nov. 11, 1976,. This application Jul. 24, 1981, Ser. No. 286,444
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **5 Claims**



1. In a computing system having at least one main memory, one central processing unit, and a plurality of input/output devices, apparatus for transferring information including format control signals, between said units comprising, in combination:

a first electrical bus coupled to transfer information as parallel bits including said format control signals to and from each of said plurality of input/output devices and between any two of said plurality of input/output devices;

a second electrical bus coupled to transfer information as parallel bits including said format control signals to and from either said main memory or said central processing unit and between said main memory and said central processing unit; and

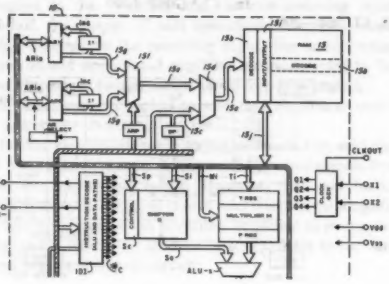
formatting means having a single input/output port connected to said first and second electrical buses, said formatting means controlling the bidirectional transfer of information between one of said plurality of input/output devices and either said main memory or said central processing unit and including decoding logic circuitry responsive to said format control signals, received from the second electrical bus, including a predetermined format control signal in a first state to generate a first set of predetermined selection signals, said formatting means further comprising a plurality of multiplexer circuits, each associated with a bit of the first electrical bus, responsive to said first set of said predetermined selection signals and to the parallel bits on the second electrical bus to change the format of information passing from either said central processing unit or said main memory through said second electrical bus to said one of said plurality of input/output devices through said first electrical bus, said format being selected from a first of a plurality of formats determined by said format control signals,

said decoding logic circuitry responsive to said format control signals, received from the second electric bus, including said predetermined format control signal in a second state to generate a second set of predetermined selection signals, said multiplexer circuits being responsive to said second set of said predetermined selection signals and to the parallel bits on the second electrical bus to change the format of information passing from either said central processing unit or said main memory through said second electrical bus to said one of said plurality of said input-/output devices through said first electrical bus, said format being selected from a second of said plurality of formats determined by said format control signals.

4,494,187
MICROCOMPUTER WITH HIGH SPEED PROGRAM MEMORY

Richard D. Simpson, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,960
Int. Cl.³ G06F 13/00
U.S. Cl. 364—200 **10 Claims**



1. A microcomputer device formed in a single integrated circuit comprising:

(a) an arithmetic/logic unit having data input and data output to perform operations in response to commands;

(b) storage means for storage of data to be supplied to said data input of the arithmetic/logic unit and received from said data output, and for storage of addreses;

(c) bus means coupled to the storage means and to the data input and data output of the arithmetic/logic unit for selectively transferring data from the storage means to said data input of the arithmetic/logic unit and from the data output of the arithmetic/logic unit to said storage means, under control of commands:

(d) control means having an input, said control means generating said commands in response to instruction words received at said input of the control means; and

(e) program memory means having an address input and a memory output, said program memory means storing said instruction words and supplying an instruction work to the memory output for transfer to the control means in response to an address from the storage means,

(f) the program memory means including an array of rows and columns of memory cells with column lines connected to the columns of cells,

(g) and precharging means connected to precharge the column lines before each operating cycle to a level below a supply voltage level and determined by the voltage on the column lines.

4,494,188
METHOD OF PROCESSING AN OPERATING SYSTEM IN A MULTI-PROCESSOR SYSTEM

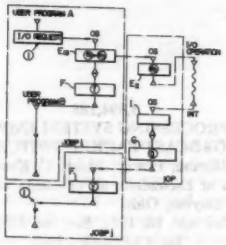
Keiichi Nakane, Kokubunji; Toshiro Kamiuchi, Kodaira, and Hiroaki Nakanishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,312
Claims priority, application Japan, Apr. 3, 1981, 56-49312
Int. Cl.³ G06F 9/00, 15/16
U.S. Cl. 364—200 **6 Claims**

1. A method of controlling the execution of a control program known as an operating system for controlling the execution of user's programs in a multi-processor system having a plurality of processors and a memory for storing said control program and said user's programs to be executed by each of said processors, said control program and said user's programs including operating system process execution instructions for initiating operating system control, said memory being connected to said plurality of processors for use in common therewith, said control program being divided into a plurality of subprograms which are concurrently executable to perform respective operating system processes and said memory further storing supervising data including status data prepared for each of said operating system processes, said method comprising:

a first step in which, when a given operating system process execution instruction contained in said user's programs or said control program is executed in any of said processors, the status data in said memory corresponding to the operating system process designated by said operating system process execution instruction is changed from wait-state data to ready-state data;

a second step in which, when any one of said processors is executing one of said user's programs, such processor intermittently interrupts the execution of the user's program to read out from said memory said status data and to detect the presence of the ready-state data relating to any operating system process;



a third step in which when said ready-state data relating to an operating state process is present and detected, any of said processors detecting said ready-state data executes the ready-state operating system process relating thereto, while any of said processors which detect no ready-state data resumes executing the interrupted user's program; and

a fourth step in which, when the execution of a ready-state operating system process is completed by a processor, that processor executing said ready-state operating system process again reads out from said memory said status data to detect the presence of other ready-state data relating to another ready-state operating system process.

4,494,189
METHOD AND MEANS FOR SWITCHING SYSTEM CONTROL OF CPUS

George H. Bean, Hyde Park, and Peter H. Gum, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,754
Int. Cl.³ G06F 9/10
U.S. Cl. 364—200 **24 Claims**

1. A method of switching the control of a CPU in a MP or UP data processing system among a plurality of system control programs (SCPs), a next instruction to be executed by the CPU a particular SCP of the plural SCPs to control the CPU being located by an instruction address in PSW (program status word) means in the CPU, each SCP requiring a hardware-to-software interface area (PSA) in a main storage of the system for storing old PSW values and obtaining new PSW values for the PSW means, comprising the CPU controlled steps of:

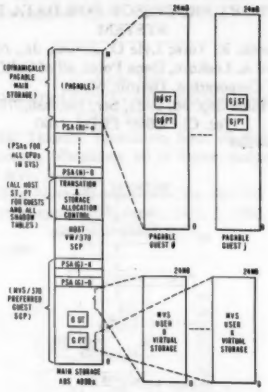
sensing an event occurring in, or signalled to, the CPU that selects a preset state in the CPU,

identifying which SCP is currently controlling the CPU to indicate the currently controlling SCP,

determining from the selected preset state in the CPU and respond to the event sensed by the sensing step, the particular SCP not required to be a SCP that operated the CPU immediately prior to the currently controlling SCP,

loading a prefix register by hardware/microcode means in the CPU with a prefix value fetched from main storage for locating the PSA of a particular SCP determined by the determining step to be the next SCP to control the CPU when the identifying step indicates the particular SCP is not in control of the CPU,

interrupting the CPU operation after the loading step is



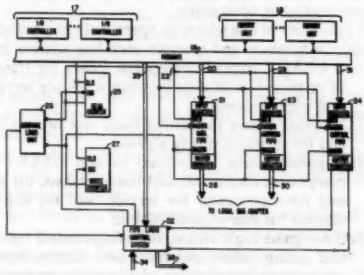
executed by storing a value in the PSW means into, and by loading the PSW means with a new PSW value from, fields associated with the sensed event in the PSA located by the address in the prefix register,

whereby the loading step executes a CPU control switch for changing the control of the CPU from the currently controlling SCP to the particular SCP which is to control the CPU for responding to the event.

4,494,190
FIFO BUFFER TO CACHE MEMORY

Arthur Peters, Sudbury, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 12, 1982, Ser. No. 377,299
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising a plurality of units including a central processor unit (CPU), a subordinate processor (SUB), an input/output unit (I/O), a system memory and a common electrical bus coupled to each of the units for providing a path for the transfer of information between any of said units during specified periods of time, the system further comprising:

a local bus coupled to the CPU and subordinate processor unit;

a cache memory and memory management unit coupled to the local bus; and

a bus adapter coupled to the cache memory and memory management unit and to the common electrical bus, the bus adapter comprising:

(a) first means coupled to the common electrical bus for monitoring information being transmitted from one of said plurality of units to another;

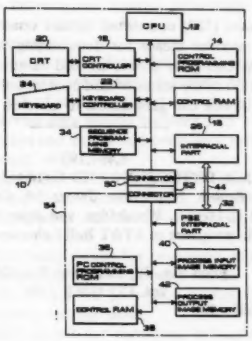
(b) second means coupled to said first means for detecting which information is pertinent to the local bus because it is addressed to a unit on the local bus or it is to be written into the system memory; and

(c) third means including a first-in-first out buffer (FIFO) coupled to the common electrical bus and to said second means for intercepting information from the common electrical bus and forwarding only that information which is detected as pertinent to the cache memory and memory management unit.

4,494,191
SIMULATION UNIT SHARING THE SAME CPU AS A PROGRAMMING CONTROL UNIT

Yoshifumi Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,880
Claims priority, application Japan, Jun. 25, 1981, 56-98748
Int. Cl.[3] G06F *9/00*
U.S. Cl. 364—200 **2 Claims**



1. A programming system fitted with CRT comprising:

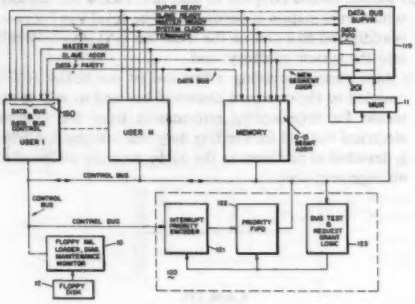
a programming control unit fitted with CRT being composed of a central processing unit (CPU), a control programming ROM and a controlling RAM being connected to said central processig unit, a CRT and a keyboard connected with said central processing unit through a CRT controller and a keyboard controller, respectively, and an interfacial part for connecting said programming control unit with a simulation unit, a connector for the connection of said CPU to said simulation unit, and a sequence programming memory; and

said simulation unit being composed of a control programming ROM for said programmable controller, a control RAM, and respective memories corresponding to a process input image memory, said simulation unit including an interfacial part and means for connecting said interfacial part to said interfacial part of said programming control unit, and a connector, and means for connecting said connector to said connector of said programming control unit.

4,494,192
HIGH SPEED BUS ARCHITECTURE

Eugene K. Lew, Sunnyvale, and Harvey W. Wallace, San Jose, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,493
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **19 Claims**



1. A bus architecture system for selectively connecting a plurality of user devices to each other, comprising,

priority interrupt encoder means (121) for receiving and prioritizing interrupt signals from one or more of said user devices when one or more of said user devices attempt to access another user device,

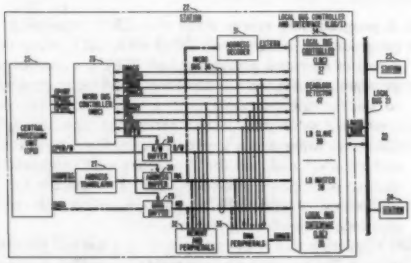
control bus means interconnecting each of said user devices, and

test means (123) connected to said control bus means and said encoder means for determining when said encoder means can gain access to said control bus means as a function of the status of said control bus means so that one user device can gain access to another user device.

4,494,193
DEADLOCK DETECTION AND RESOLUTION SCHEME

David J. Brahm, Naperville; James M. Grinn, Warrenville; Edward L. Hepler, Woodridge, and John M. Sullivan, Lisle, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1982, Ser. No. 430,396
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **44 Claims**



1. A communication system comprising:

a communication medium;

a first and a second station adapted to access the medium for communication, the second station further adapted for access by the first station;

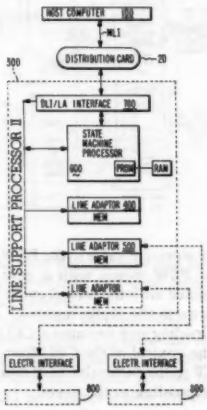
means for detecting access by the first station of the second station while the second station is accessing the medium; and

means responsive to the detecting means for pausing the access by the second station and for continuing the access by the second station when the first station ceases accessing the second station.

4,494,194
LINE SUPPORT PROCESSOR FOR DATA TRANSFER SYSTEM

Craig W. Harris, El Toro; Lyle O. Jevons, Jr., Mission Viejo, and Richard A. Loskorn, Dana Point, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 430,575
Int. Cl.³ G06F *13/00, 3/00*
U.S. Cl. 364—200 **3 Claims**



1. In a data-comm subsystem wherein a line support processor controls data transfer operations between a host computer and remote data terminals, and said line support processor includes a plurality of line adapters, a data link interface unit and a microprocessor, said microprocessor including program data in an internal PROM and in external RAM storage means and having an I/O bus and output control registers providing control data and information data to said line adapters, said line support processor comprising:

(a) a plurality of line adapters, operatively controlled by said microprocessor, and wherein each line adapter includes:

(a1) USART control component means for transmission of or reception of data between a remote terminal and said microprocessor;

(a2) timing means for setting baud rate of data transfers and for protocol timing signals;

(a3) gating means, connected to said USART control component means and said timing means, for signaling said microprocessor for service, and for activating a discrete bit line of said I/O bus;

(a4) designate logic means, receiving control signals from said gating means and from said microprocessor, for selecting a particular line adapter and a particular register in said USART means or said timing means;

(b) said microprocessor operating to enable a data transfer path from a requesting USART/timing means to said I/O bus for transfer of data to said microprocessor and including:

(b1) means to scan said I/O bus lines to identify the activated bit line which designates a particular line adapter;

(b2) means to select which input line of each of a plurality of multiplexors will be connected for throughput;

(c) said enabled data transfer path including:

(c1) driver-controller bus means for connecting a selected USART/timing means via a data transfer bus to a group of said multiplexors for data transfer to said microprocessor;

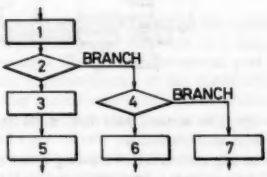
(c2) a data transfer bus connected to a group of n said multiplexors for parallel-transfer of n bits of data;

(c3) a plurality of groups of said multiplexors wherein each group of n said multiplexors connects n bits from said data transfer bus to said I/O bus.

4,494,195
MICROINSTRUCTION CONTROLLED DATA PROCESSOR

Kouki Noguchi; Takashi Tsunehiro, both of Kokubunji, and Hideo Nakamura, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 444,711
Claims priority, application Japan, Dec. 2, 1981, 56-192933
Int. Cl.³ G06F 9/26
U.S. Cl. 364—200 **4 Claims**



1. A microinstruction controlled data processor comprising:

an address register;

storage means adapted to be driven in each of predetermined cycles for reading out a predetermined number of microinstructions on the basis of the page address which is stored in said register, a first field of each of said microinstructions containing a page address for addressing the subsequent microinstruction which is to be read out after said predetermined cycles in view of the read-out cycles of the respective microinstructions, a second field of a general instruction other than a branch-on-condition instruction containing a displacement address for addressing said subsequent microinstruction, and a second field of said branch-on-condition instruction containing information for addressing a branch condition;

means for selecting one of the read-out plural microinstructions upon each of said read-out operations;

setting means made synchronous with said selecting operation for setting said register with the first and second fields of said selected instructions with a delay of said predetermined number of cycles from the timing at which the page address for reading out said selected instructions is set in said address register;

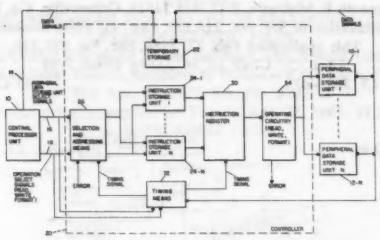
means for detecting on the basis of the second field of said selected branch instruction whether the branch addressed by said branch instruction succeeds or not when said selected microinstruction is the branch instruction; and

address generating means partly for generating the displacement address for addressing the microinstruction to be selected in a subsequent cycle at each end of said selecting operations and partly for feeding the same to said selecting means, said displacement address being generated by said selecting means on the basis of both the output of said detecting means during said predetermined number of cycles until the time for the processing operation and the displacement address existing in said address reigister at the time for the processing operation.

4,494,196
CONTROLLER FOR PERIPHERAL DATA STORAGE UNITS

Michael T. Greer, North Andover, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 265,257, May 19, 1981, abandoned.
This application Sep. 7, 1983, Ser. No. 530,191
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **3 Claims**



1. In a data processing system having a central processing unit and a plurality of peripheral data storage units, said peripheral units employing disparate operating control signals and operating at disparate characteristic data signal processing frequencies, said central processing unit providing read, write, format, and storage unit select control signals,

a controller connected to said central processing unit and to said peripheral data storage units, and configured to transfer, in response to control signals from said central processing unit, data signals between said central processing unit and any of said peripheral storage units,

said controller including

temporary data storage means for holding data signals temporarily, while being transferred between said central processor and any of said peripheral storage units,

means for transferring data signals between said temporary data storage means and any of said peripheral units or said central processing unit,

instruction storage means for storing instructions for read, write, and format operations effecting transfer of data between said temporary storage unit and said peripheral storage units,

selection and addressing means for providing selected address signals to said instruction storage means,

operating circuitry means for providing signals to control said peripheral data storage units,

instruction register means for receiving instructions from said instruction storage means and providing selected input signals to said operating circuitry means,

timing means for providing periodic timing signals controlling the rate of processing of sequential instructions, wherein

instructions stored in said instruction storage means are stored in blocks of contiguous addresses, each block containing exclusively the instructions for carrying out a read, write, or format function for a specific peripheral unit, the instructions within each block being stored at addresses in a sequential order corresponding without exception to the temporal order of implementing the instructions for the function and peripheral unit corresponding to the block,

said selection and addressing means transmits in response to a signal from said central processor a sequence of address signals to said instruction storage unit beginning with an initial address selected in accordance with said read, write, format, and storage unit select control signals, said initial address being the first address of the block of contiguous addresses relating to the function specified by the read, write, and unit select control signals, and

said timing means includes means responsive to said control

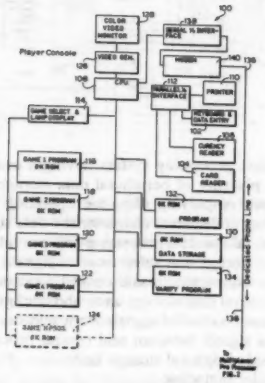
signals provided by said central processing unit and specifying a particular one of said peripheral units and a particular one of said functions for selecting periodic timing signals repeated at the characteristic rate of operation of any of said peripheral units, said timing signals being applied to increment the current instruction of the instruction register.

4,494,197

AUTOMATIC LOTTERY SYSTEM

Seymour Troy, P.O. Box 5027, Fort Lauderdale, Fla. 33310, and Kenneth E. Mullenix, P.O. Box 14521, Gainesville, Fla. 32601

Continuation of Ser. No. 215,150, Dec. 11, 1980, abandoned.
This application Feb. 22, 1984, Ser. No. 581,218
Int. Cl.³ G06F *15/28, 15/44*; G06G *7/48*
U.S. Cl. 364—412 **43 Claims**



1. A lottery system free of player skill which is preprogrammed so as to be preset as to when a winning play will occur, said system comprising:

a central processor;

a plurality of playing means remote from the central processor but communicating therewith;

said playing means being capable of supplying data corresponding to a particular play by a player on a particular playing means to the central processor;

a means of determining an amount played;

a means of identifying a particular player;

the central processor being capable of directing data to a particular playing means and having a data storage means capable of storing data directed to it by the playing means; and

said central processor having preprogrammed means capable of preselecting what particular play will be a winning play based upon a pre-established standard for winning plays not dependent upon any external factors and outside events and acknowledging a winning play to the particular means.

4,494,198

GUN FIRE CONTROL SYSTEMS

Gordon R. Smith; John H. Stewart, both of Glasgow, and Ralph H. Bagnall-Wild, Helensburgh, all of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Feb. 26, 1982, Ser. No. 352,696
Claims priority, application United Kingdom, Mar. 12, 1981, 8107756
Int. Cl.³ G06F *15/58*; G06G *7/80*
U.S. Cl. 364—423 **7 Claims**

1. A gun fire control system comprising

means for presenting a command signal representing a range value to a system operator,

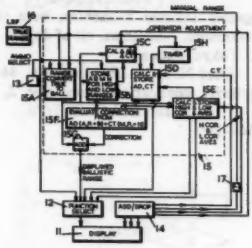
manually-operable means for providing a range correction input by a system operator as a measure of the extent by which a projectile misses a target sighted according to the command signal,

a rangefinder for establishing a true range value to the target,

first memory means preprogrammed with true range to standard ballistic range conversion data and responsive to receipt of a true range value to output the corresponding standard ballistic range value from said conversion data,

second memory means preprogrammed with preset correction coefficients,

first calculating means for evaluating air density and charge temperature parameters according to the outputs of said



manually-operable means, said first memory means and said second memory means,

second calculating means for evaluating a correction factor utilising the parameter values evaluated by said first calculating means, the standard ballistic range value output by said first memory means and the correction coefficients from said second memory means,

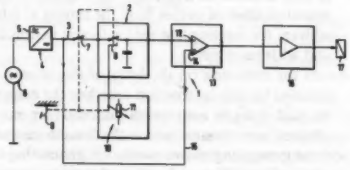
combining means for combining the standard ballistic range value output by said first memory means and the correction factor output by said second calculating means to provide a corrected ballistic range value for delivery to said presenting means and against which to sight the target for firing a subsequent projectile.

4,494,199

BRAKE SYSTEM, ESPECIALLY FOR A MOTOR VEHICLE

Ulrich Lehmann, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 16, 1982, Ser. No. 418,682
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137207
Int. Cl.³ B60T *8/00*
U.S. Cl. 364—426 **11 Claims**



1. A brake system which includes a control installation storing data representing a characteristic curve of vehicular deceleration for influencing the deceleration of a motor vehicle and at least one friction brake means, comprising

measuring means for sensing the position of a brake pedal,

means operatively connecting the control installation and the brake means for effecting deceleration of the vehicle in

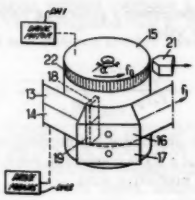
accordance with said stored characteristic curve and in response to the measuring means.

4,494,200

PROCESS AND APPARATUS FOR FIXING THE POSITION OF A MOVING VEHICLE ON A MAP

Do Man Lam, Velizy, France, assignor to Matra, France

Filed Jan. 11, 1982, Ser. No. 338,627
Claims priority, application France, Jan. 14, 1981, 81 00571
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—449 **11 Claims**



7. A navigation apparatus for fixing the position of a vehicle moving in a predetermined direction on a map, comprising:

a map having a first part and a second part providing two different representations of the distribution of the same parameter representative of a predetermined ground condition in the vehicle and over an area whose width to the left and right of said path is at least equal to the greatest possible expected deviation of the vehicle from its theoretical path, the transparency ī at each point of said area in said first part being in direct relation to the value of said parameter at the point and the transparency i at each point of said area in said second part being to the value of said parameter at that point;

means onboard the vehicle for measuring successive values of said parameter at respective successive locations of the vehicle along its actual path of movement,

means for storing said actual values over a predetermined distance p,

first and second lighting means located on one side of said first and second parts, respectively, for directing light of controllable intensities through said first and second parts, respectively,

first light sensor means, located on the other side of said first part, for accumulating the light received from said first lighting means through an associated band of said first part of length p located at a predetermined transverse offset distance from an expected location of said vehicle along said theoretical path,

second light sensor means, located on the other side of said second path, for accumulating the light received from said second lighting means through an associated band of said second part located at said predetermined transverse offset distance from said theoretical path and at the same predetermined distance from said expected location as said band of said first part,

first and second control means, operatively connected to said storing means, for controlling one of said lighting means such that the intensity of the light directed through a particular point along said distance p is in direct relation to the stored value of said parameter at said point and for controlling the other lighting means such that the intensity of the light therefrom is in reverse relation to said stored value;

means for varying the location of the associated bands on the map;

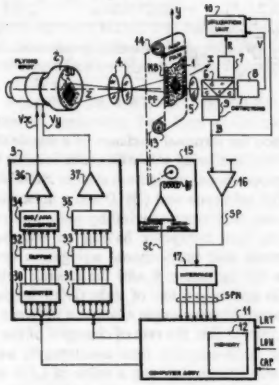
and correlation means connected to said first and second light sensor means for determining the transverse position and longitudinal position of the associated bands for which correlation between the light intensities is optimized and which corresponds to the actual true position of the moving vehicle.

4,494,201

MOVING-MAP DISPLAY WITH RECORDING ON PHOTOGRAPHIC FILM

Jean-Claude Reymond; Gilles Bertrand, and Roland Gabanou, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 27, 1982, Ser. No. 372,332
Claims priority, application France, Apr. 27, 1981, 81 08346
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—449 **10 Claims**



1. A moving-map display with recording of a map on a photographic film carried by spools, comprising:

a video image reader using a line-by-line scanner which scans a map image formed on said film,

a computer for generating position servo-control data to control scanning of the film image of the basis of heading, longitude and latitude parameters of a vehicle carrying the moving-map display,

said computer comprising means for electronically correcting said servo-control data to take account both rotation due to the heading and translations in x transverse with respect to the film to be produced as a function of the longitude, as well as a servo-control in y of the film in the longitudinal direction by rotation of the spools as a function of the latitude,

said film comprising successive images forming said recorded map, lateral perforations, and coded inscriptions between the perforations, said coded inscriptions corresponding to numbering of said images,

said computer also comprising means for controlling said image reader to produce a cyclic lateral scan in y at the location of a row of said perforations to produce longitudinal position information and permit the calculation of fine resetting data in y to be transmitted to the servo-control based on the position of said perforations relative to said inscriptions, and

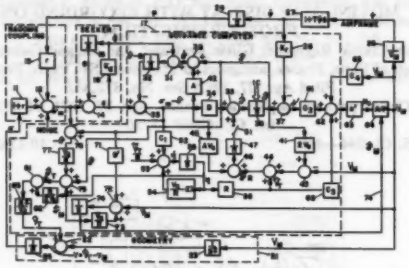
displaying means comprising a cathode-ray indicator for displaying a corrected video image corresponding to the map image scanned by said reader based on the corrrected control data.

4,494,202

FOURTH ORDER PREDICTIVE, AUGMENTED PROPORTIONAL NAVIGATION SYSTEM TERMINAL GUIDANCE DESIGN WITH MISSILE/TARGET DECOUPLING

William R. Yueh, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 22, 1982, Ser. No. 421,538
Int. Cl.[3] G05B 13/02; G06G 7/80
U.S. Cl. 364—462 15 Claims



1. A method for terminal guidance of a missile to intercept a target, said method being a fourth order scheme employing a predictive proportional navigation system including an autopilot, an inertial reference unit (IRU) and a noise adaptive guidance computer, said system including noise and radome error compensation, said computer having an adaptive guidance filtering system, said proportional navigation system having input values for the range R and the closing velocity V_c between missile and target, line of sight (LOS) angle σ, antenna electrical boresight error angle ϵ, angle θ between the antenna axis and the missile axis, the rate of change $\dot{\theta}$ of the angle θ, and time varying noise-adaptive time constants τ_d and τ_c, where $\epsilon=\sigma_m-\theta$, said system deriving a value of LOS angle σ_m, an estimate of LOS angle σ and a residual LOS angle $\sigma_m-\sigma$, the output of said filtering system being a smoothed line of sight rate $\dot{\sigma}$, actual missile lateral acceleration being detected by said IRU, the output of said IRU being a measure of actual lateral acceleration Y_M, said method comprising the steps of:

applying the boresight error angle ϵ to a first combining point;

multiplying the residual LOS angle output from said first combining point by a gain A to provide the value $A(\sigma_m-\sigma)$;

combining the value $A(\sigma_m-\sigma)$ with the LOS rate $\dot{\sigma}$ at a second combining point to provide an estimated LOS rate $\dot{\sigma}$;

combining said estimated LOS rate $\dot{\sigma}$ with said rate $\dot{\sigma}$ to provide the value $\dot{\sigma}-\dot{\sigma}$;

integrating the value $\dot{\sigma}-\dot{\sigma}$ to provide $\sigma-\theta$;

feeding back the value $\sigma-\theta$ to said first combining point;

combining said value $\sigma-\theta$ with the angle ϵ to provide the value $\sigma_m-\sigma$ at the input to said filtering system;

multiplying the residual LOS angle by a gain B to provide the value $B(\sigma_m-\sigma)$;

multiplying the LOS rate $\dot{\sigma}$ by $2V_c$;

combining said multiplied LOS rate with acceleration term Y_M at a third combining point to provide the term $2V_c\dot{\sigma}-Y_M$;

feeding back said term $2V_c\dot{\sigma}-Y_M$ to a fourth combining

multiplying the residual LOS angle by AV_c to provide the value $AV_c(\sigma_m-\sigma)$;

feeding forward said value $AV_c(\sigma_m-\sigma)$ to a fifth combining point;

multiplying the residual LOS angle by a gain C_1 to provide the term $C_1(\sigma_m-\sigma)$;

combining the term $C_1(\sigma_m-\sigma)$ with target acceleration and range input values to provide an estimated target lateral acceleration value Y_T;

feeding forward said value Y_T to said fourth combining point;

combining Y_T with the value $2V_c\dot{\sigma}-Y_M$ at said fourth combining point to provide an estimated LOS acceleration term $\dot{\sigma}R$;

combining the values $AV_c(\sigma_m-\sigma)$ and $\dot{\sigma}R$ at said fifth combining point to provide the value

$$2V_c\dot{\sigma}-Y_M+Y_T+AV_c(\sigma_m-\sigma);$$

dividing the immediately preceding value by the range R to provide the value

$$\eta+\frac{2\dot{\sigma}}{T_{go}}-\frac{\gamma_M}{V_cT_{go}}+\frac{A}{T_{go}}(\sigma_m-\sigma);$$

combining the immediately preceding value with the value $B(\sigma_m-\sigma)$ at a sixth combining point to provide the corrective and predictive term

$$\dot{\sigma}=\eta+\frac{2\dot{\sigma}}{T_{go}}-\frac{\gamma_M}{V_cT_{go}}+\left(B+\frac{A}{T_{go}}\right)(\sigma_m-\sigma);\text{ then}$$

integrating the term $\dot{\sigma}$ to provide the smoothed LOS rate σ;

multiplying the residual LOS angle by gain B' to provide the term $B'(\sigma_m-\sigma)$;

combining $B'(\sigma_m-\sigma)$ with missile lateral acceleration value σ_M and missile velocity estimate $\dot{\sigma}_mV_c/R$ at an eighth combining point to provide the output term

$$\frac{\dot{\sigma}_mV_c}{R}-\gamma_M+B'(\sigma_m-\sigma);$$

integrating the immediately preceding value to provide the estimated missile LOS rate component σ_M;

applying said LOS rate estimate σ_M to said autopilot to provide body angle information;

combining said LOS estimated rate σ in a ninth combining point with missile LOS rate σ_M and a function of estimated $LOS-\sigma V_c/R$ to provide the output σ_T, the target estimated LOS rate component;

combining said target LOS rate component in a tenth combining point with a function of change in LOS rate due to target acceleration $\rho R/2V_c$;

multiplying the output of said tenth combining point by R^2/V_c to provide the estimated target lateral displacement Y_T;

twice integrating said missile lateral acceleration term Y_M to provide missile lateral displacement Y_M;

combining said target and missile lateral displacements in an eleventh combining point to provide the miss distance Y evaluated at intercept, $Y=Y_T-Y_M$;

dividing said miss distance Y by range R to provide system input, LOS angle σ;

gains A, B, B' and C_1 are noise-adaptive and dependent upon time-to-go, while the guidance filter output $\dot{\sigma}$ is also range dependent and includes both corrective and predictive terms; where

$$A=(1/\tau_d)+(1/\tau_c),$$

$$B=1/(\tau_d\tau_c),$$

and

$$B'=KB,$$

and C_1 noise adaptively varies inversely proportional to τ_d;

multiplying a function of said guidance filter output $\dot{\sigma}$ by a

gain C_2 and applying that product to a seventh combining point;

multiplying the estimated target lateral acceleration term Y_T by a gain C_3 which is a function of target bandwidth λ_T and T_{go}, the value C_3Y_T being fed forward to said seventh combining point;

multiplying said seventh combining point output $C_3Y_T+C_2\sigma$ by the navigation ratio n' which is a function of control effort weighting factor γ and T_{go}; and

applying the immediately preceding term to said autopilot as command acceleration to modify the position of the missile control surfaces and to account for target lateral acceleration, employing optimal guidance Law C to define gains C_2 and C_3 and navigation ratio n', thereby providing nearly optimal miss distance and low sensitivity to radome error.

4,494,203

METHOD FOR CORRECTING THE DEVIATION OF A PREDETERMINED STOP POSITION IN A LOOM

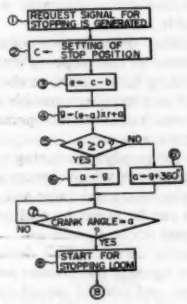
Hajime Suzuki, Anjo; Shinichiro Matsuyama, and Akio Arakawa, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 13, 1982, Ser. No. 367,959

Claims priority, application Japan, Apr. 18, 1981, 56-57822

Int. Cl.³ D03D *51/44;* **G05B** *19/26*

U.S. Cl. 364—470 **3 Claims**



1. A method for braking a rotatable shaft coupled to the driving mechanism of a loom, so that the shaft stops at a predetermined crank angular stop position during successive braking operations occurring at randomly spaced time intervals by means of a braking device cooperating with and being connected with a motor for driving said loom, said method comprising the steps of:

(a) determining the positional deviation between the actual stop position obtained during the last conducted braking operation and said predetermined stop position and storing the value of said positional deviation in a read/store enable memory, said positional deviation being determined according to the relation

$$e \leftarrow c - b$$

where the symbol c denotes a crank angle, as digital data, corresponding to the predetermined stop position, the symbol b denotes a crank angle, as digital data, corresponding to an angular range through which the braking operation is completed, and the symbol e denotes resultant digital data derived from the operation of "c−b", indicating the positional deviation;

(b) reading the positional deviation from said read/store enable memory and determining a resultant crank angle numerical value according to the relationship

$$g \leftarrow (e-a)\gamma + a$$

where the symbol a denotes a crank angle, as digital data, at which the braking operation commences, the symbol γ has a value less than 1 and denotes a predetermined correction factor, and the symbol g denotes a resultant crank angle digital value;

(c) determining whether the resultant crank angle value g is positive or negative;

(d) determining the crank angle value a' at which the next succeeding braking operation is to be initiated, (i) according to the relationship $a' \leftarrow g$ when g is positive and (ii) according to the relationship $a' \leftarrow g+360°$ when g is negative, thereby effecting correction of the position for commencing the braking operation;

(e) initiating said next succeeding braking operation by means of said braking device immediately when the crank angle coincides with the crank angle value a'; and

(f) repeating steps (a) through (e) automatically every time the next following braking operation is performed.

4,494,204

CARDING MACHINE OR ROLLER CARD

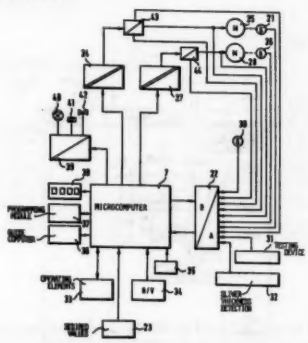
Fritz Hösel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,294

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120133

Int. Cl.³ G06F *15/46;* **D01G** *15/40, 15/48;* **D01H** *5/42*

U.S. Cl. 364—470 **24 Claims**



1. Apparatus for forming fiber material into a length of sliver, comprising: carding means, comprising a carding cylinder, a feed roller and a doffer, for receiving such fiber material and forming it into the length of sliver; sensing means for monitoring the operation of said carding means and providing signals representative of that operation; analog/digital converter means connected to said sensing means for receiving the signals provided by said sensing means and converting those signals into digital representations of the operation of said carding means; a digital electronic control unit connected to receive the digital representations formed by said analog/digital converter means and including a microprocessor having memories, means for generating digital representations of desired values of selected operating parameters of said carding means, and means performing operational, regulating, control and display functions, said control unit being arranged to provide digital signals for regulating the operation of said carding means; digital/analog converter means connected to said control unit for deriving analog signals corresponding to the digital signals provided by said control unit; and controllable regulator means controlled by the analog signals derived by said digital/analog converter means for regulating the operation of said carding means; said control unit supplying

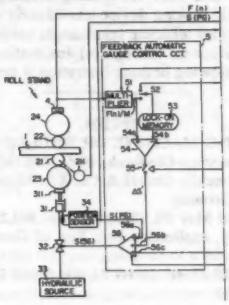
signals via said converter means to said regulator means for matching the speeds of said carding cylinder, said feed roller and said doffer to one another.

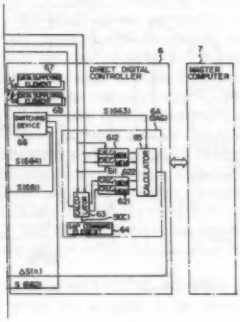
4,494,205

METHOD OF ROLLING METAL

Osamu Dairiki; Humio Ookuma, and Hiroyuki Asano, all of Oita, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,782
Claims priority, application Japan, Dec. 26, 1980, 55-185616
Int. Cl.³ G05B *13/04*; B21B *37/00*
U.S. Cl. 364—472 **4 Claims**





1. A method of rolling metal for producing a metal plate or a metal sheet having a desired range of thickness through a sequence of rolling passes, said method comprising the steps of:

detecting variations in deformation resistance of the metal which is being rolled along a longitudinal direction of the metal;

estimating, on the basis of the detected variations in the deformation resistance of the metal of at least one preceding pass, the variations in deformation resistance and a resulting variations in rolling force in the finishing pass along the longitudinal direction of the metal using a rolling force estimation equation and a deformation resistance estimation equation;

calculating and physically forming a distribution of thickness of the metal before the entrance of the finishing pass along the longitudinal direction of the metal, using said estimated variations in deformation resistance and in rolling force; and

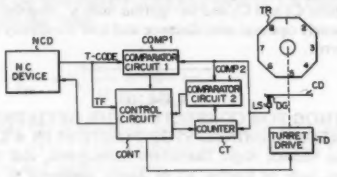
rolling the metal so as to obtain the distribution of the thickness of the metal necessary to cancel the variation in the rolling force at the entrance of the finishing pass.

4,494,206

CONTROL DEVICE FOR INDEXING A STEPPING ROTATABLE MEMBER

Ryoji Imazeki, and Katsuaki Kusumi, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP81/00161, § 371 Date Mar. 10, 1982, § 102(e) Date Mar. 10, 1982, PCT Pub. No. WO82/00264, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 10, 1981, Ser. No. 359,672
Claims priority, application Japan, Jul. 10, 1980, 55-93225
Int. Cl.³ G06F *15/46*; G05B *19/29*
U.S. Cl. 364—474 **4 Claims**



1. A control device for indexing stepping rotatable member comprising:

a stepping rotatable member which can stop at a plurality of angular positions;

an indexable rotative drive apparatus which rotates said stepping rotatable member;

means for generating different positional code signals at every stop position of said stepping rotatable member;

means for generating incremental strobe signals at every stop position of said stepping rotatable member;

a control circuit which controls the operation of said indexable rotative drive apparatus;

a numeric means for supplying indexing command values;

a first comparator circuit which detects a coincidence between an indexing command value and said code signal;

a counter, which can be preset by said control circuit and which counts said strobe signals; and

a second comparator circuit which detects a coincidence between a count signal of said counter and said code signal value, such that said control circuit supplies a rotation command to said indexable rotative drive apparatus when said indexing command is supplied thereto from said numeric means, supplies a stop command to said rotative drive apparatus when said first comparator circuit detects a coincidence, and outputs an "end of indexing signal" to said numeric means when both said first and second comparator circuits detect coincidences.

4,494,207

DUAL TURBINE CONTROLLER

Hsiao-Nan L. Chang, and John A. Cline, both of Leominster, Mass., assignors to General Electric Company, Lynn, Mass.

Filed Apr. 15, 1982, Ser. No. 368,737
Int. Cl.³ G06F *15/46*; H02P *9/04*
U.S. Cl. 364—494 **3 Claims**

1. In a control system effective to produce a control signal for controlling a turbine having a shaft rotating at a speed controllable by a position of a valve, said valve being responsive to said control signal, said control system including primary and secondary controllers; the control system including means for producing a speed command signal, a speed feedback signal and a valve position feedback signal, each of said controllers, comprising:

means for producing a speed error signal proportional to a difference between said speed command and speed feedback signals;

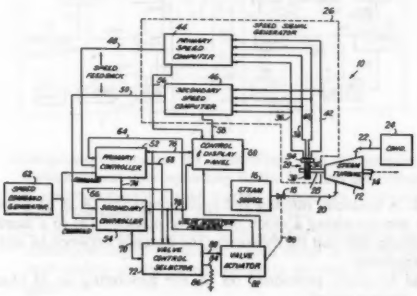
a valve command generator responsive to said speed error to produce a valve command signal;

means for producing a valve drive signal in response to a

difference between said valve command and valve position feedback signals;

a comparison circuit receiving at least some of said speed feedback, speed error, valve command, valve position feedback and valve drive signals;

means for communicating said, valve command, valve position feedback and valve drive signals in each one of said primary and secondary controllers to the comparison circuit in the other one thereof, the comparison circuit in each of said primary and secondary controllers being



effective to detect differences between inputs from its own and from the other controller and, upon determining that said differences may indicate that its controller is bad, producing a one bad signal indicative of this fact; and,

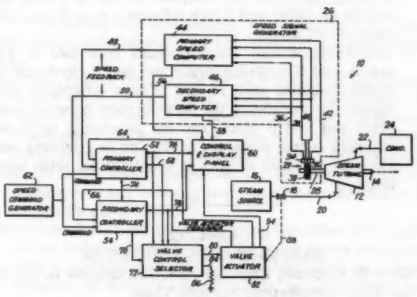
a system mathematical model responsive to at least some of inputs and outputs of said controller effective to predict correct responses of said controller to said inputs, said system mathematical model being effective to produce a controller bad signal when its controller produces outputs inconsistent with its inputs.

4,494,208

BUMPLESS SWITCHING OF VALVE DRIVE IN A TURBINE CONTROL SYSTEM

Hsiao-Nan L. Chang, Leominster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Apr. 15, 1982, Ser. No. 368,738
Int. Cl.³ G06F *15/46*; H02P *9/04*
U.S. Cl. 364—494 **5 Claims**



1. Apparatus for applying a first control signal from a first controller to a device for controlling speed and for transferring a second control signal from a second controller to said device for controlling speed with minimum discontinuity during said transferring, comprising:

a control selector receiving said first and second control signals;

a termination effective to terminate an unused one of said first and second control signals in a load having characteristics similar to said device for controlling;

means in said control selector for applying a used one of said first and second control signals to said device for controlling and an unused one of said first and second control signals to said load;

means for delaying said unused one by a predetermined amount to produce a delayed control signal;

means effective, upon detection of a fault in the controller providing said used control signal, to substitute said delayed control signal therefor;

means for initializing the controller producing the previously unused control signal to force it to produce a control signal closely equalling a previously good control signal from the previously used controller; and

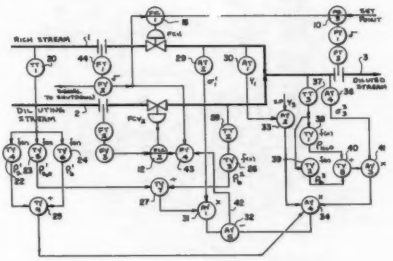
means for transferring the previously used control signal to said termination and the previously unused control signal to said device for controlling speed.

4,494,209

BLENDING CONTROL SYSTEM

Suresh C. Agarwal, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 7, 1982, Ser. No. 385,423
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—502 **3 Claims**



1. An apparatus for controlling the blending of a rich stream having a primary and a secondary component and a diluting stream to form a blended stream comprising:

(a) means connected to the rich stream for obtaining the values V_1, the volumetric flow rate of the rich stream; $\sigma_1{}^1$, the specific gravity of the rich stream; y_1, the concentration of primary component in the rich stream; $P_1{}^1a$, the density of primary components in the rich stream; $P_b{}^1$, the density of secondary component in the rich stream; and $P^1{}_{H2O}$, the density of water in the rich stream;

(b) means connected to the diluting stream for regulating the volumetric flow rate V_2 of the diluting stream;

(c) means connected to the blended stream for obtaining the values of $\sigma_1{}^3$, the specific gravity of the blended stream; y_3, the concentration of primary component in the blended stream; $P^3{}_a$, the density of primary component in the blended stream; and $P^3{}_{H2O}$, the density of water in the blended stream;

(d) logic means connected to the means connected to the rich, diluting and blended stream for obtaining a value V_2 corresponding to a desired volumetric flow rate of the diluting stream and for applying that value to the means for regulating the volumetric flow rate of the diluting stream; and

(e) wherein said logic means is operable according to the following:

$$\frac{V_2}{V_1} = \frac{P_{INO}^3}{P_b^1} \frac{P_b^1}{P_b^3} \sigma_3^3 \frac{\gamma_1}{\gamma_3} - \sigma_1^1 \frac{P_{INO}^1}{P_b^2}$$

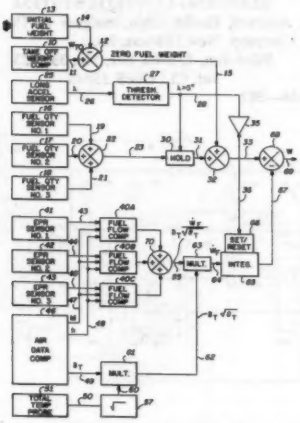
wherein P_b^2 is the density of secondary component in the diluting stream, the apparatus including means connected to the diluting stream for generating P_b^2.

4,494,210

ENROUTE WEIGHT COMPUTER FOR AIRCRAFT

Harry Miller, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,097
Int. Cl.³ G01G *19/00*; G06F *11/30*; G08G *5/00*
U.S. Cl. 364—567 **7 Claims**



1. In an engine powered aircraft, an apparatus for providing a continuous measure of the total in-flight weight comprising:

means for supplying a first total in-flight aircraft weight measure dependent upon the sum of zero fuel weight of the aircraft and weight of fuel in fuel tanks as derived from fuel level sensors disposed within said fuel tanks, and

means independent of said fuel level sensors for computing and providing a measure of the weight of fuel supplied to the aircraft engines,

wherein said independent fuel weight measure providing means comprises:

computer means responsive to an engine operation parameter, aircraft speed and aircraft altitude for providing a measure of the rate of fuel flow to said engine,

integrator means responsive to said fuel flow measure for providing a measure of the weight of fuel being consumed by said engine,

means responsive to aircraft flight conditions, said flight conditions render said fuel level sensors inaccurate, and

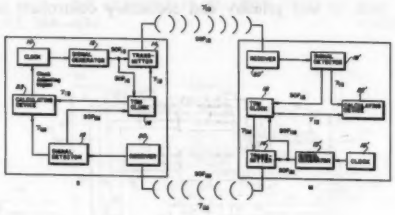
means responsive to said last-mentioned means for holding said fuel level sensor derived fuel weight measure and for subtracting from said sensor derived measure said computed fuel weight measure to thereby provide a second total in-flight aircraft weight measure during said aircraft flight conditions.

4,494,211

BALANCED SYSTEM FOR RANGING AND SYNCHRONIZATION BETWEEN SATELLITE PAIRS

Jay W. Schwartz, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1982, Ser. No. 444,139
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—571 **17 Claims**



1. A balanced ranging and synchronization (R & S) system for synchronizing a clock on a slave platform (S) to a master platform (M) and for measuring the distance between M and S comprising:

an M clock, positioned on M, for generating an M clock output signal;

an S clock, positioned on S, for generating a S clock output signal;

M signal transmitting means on M, interconnected with said M clock, for transmitting an M timing signal in response to a predetermined M clock output signal;

S signal transmitting means on S, interconnected with said S clock, for transmitting an S timing signal in response to a predetermined S clock output signal;

M receiving means on M for receiving signals, including said S timing signal, from S;

S receiving means on S for receiving signals, including said M timing signal, from M;

M time difference measuring (TDM) means, interconnected with said M clock and said M receiving means, for measuring the M time difference between the transmission of said M timing signal and the reception of said S timing signal and for encoding said M time difference in an M time difference output signal;

S time difference measuring (TDM) means, interconnected with said S clock and said S receiving means, for measuring the S time difference between the transmission of said S timing signal and the reception of said M timing signal and for encoding said S time difference in an S time difference output signal;

S calculating means, interconnected with said S TDM means, said S receiving means and said S clock and with inputs including said M and S time difference output signals, for calculating the asynchronism between said M clock and said S clock, and for generating an S clock adjusting output signal for advancing or retarding said S clock so that said S clock is synchronized with said M clock.

4,494,212

VARIABLE GAIN AMPLIFIER

William C. Muellner, Lagrange Park, Ill., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 354,408, Mar. 3, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,547
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—571 **8 Claims**

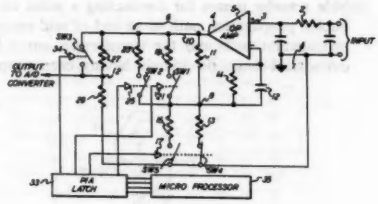
1. A variable gain amplifier, having a plurality of selectable gain ranges, comprising, in combination:

operational amplifier means,

a multipath resistor feedback network connected to said operational amplifier means,

semiconductor switch means for switching said multipath resistor feedback network into a selected one of the paths in said feedback network,

an analog to digital converter connected to the output of said feedback network,



microprocessor means for controlling said semiconductor switch means corresponding to the selected gain range,

said microprocessor means storing in memory a correction factor for each of said gain ranges, and

said microprocessor means applying the correction factor corresponding to the selected gain range to the output of said analog to digital converter to provide a corrected gain.

4,494,213

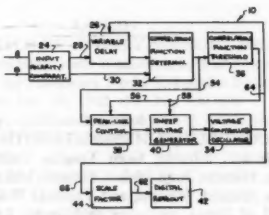
DEDICATED CORRELATOR

William L. Thompson, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 11, 1982, Ser. No. 387,642

Int. Cl.³ G06G 7/19; G01F 1/66; G01J 1/00

U.S. Cl. 364—604 **12 Claims**



1. A correlator for establishing correlation of two noise signals having positive and negative polarity components comprising:

an input polarity comparator for each signal, for generating a pulse wave for each signal having a high level upon the occurrence of one of the positive and negative polarity components and a low level upon the occurrence of the other of the positive and negative polarity components;

variable delay means connected for receiving one of the pulse waves and delaying that one of the pulse waves by a variable delay amount;

wave correlation means for receiving the other of the pulse waves and the delayed one of the pulse waves and generating a correlation signal which is high with correlation between the delayed and other pulse waves and low with low correlation thereof;

sweep means connected to said variable delay means for varying the delay amount in an increasing and decreasing direction;

peak lock means connected to said sweep means and to said wave correlation means for determining whether the correlation signal is increasing or decreasing and with a decreasing correlation signal, controlling said sweep means to change the direction of variation thereof so that a particular delay amount corresponding to a maximum correlation signal is obtained;

scaling means connected to said sweep means for receiving the particular delay amount and generating a readable signal therefrom; and

a correlation signal threshold means connected between said wave correlation means and peak lock means for permitting operation of said peak lock means only when said correlation signal rises above a selected level.

4,494,214

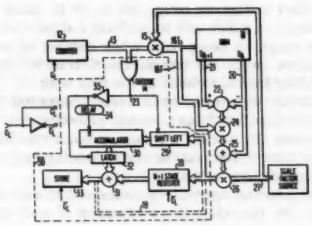
APPARATUS FOR GENERATING SCALED WEIGHTING COEFFICIENTS FOR SAMPLED DATA FILTERS

Francis S. Bernard, Brooklyn, N.Y.; Steven M. Eliscu, Ocean, and Eric P. Batterman, North Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,613

Int. Cl.³ G06F 15/31

U.S. Cl. 364—724 **13 Claims**



1. Apparatus for generating scaled weighting coefficients for sampled data filters from a set of N standard weighting coefficients, comprising:

means for storing said standard coefficients, wherein said standard coefficients are indexed in a predetermined sequence;

a terminal for applying a scale factor "a";

means for generating a sequence of numbers corresponding to the index values of the standard coefficients;

means coupled to said terminal and to said means for generating a sequence of numbers for generating the products of the scale factor times each of said numbers of said sequence wherein each product has an integer part K and a fractional part F;

means coupled to said means for storing said standard coefficients, to said terminal and responsive to said products for calculating a value for each number in said sequence according to the equation

$$H'(I)=a[(H(K+1)-H(K))F+H(K)]$$

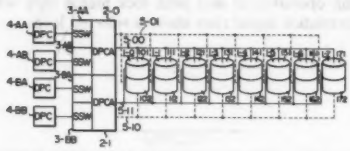
where H'(I) equals a scaled coefficient for a number in said sequence I, H(K) is a standard coefficient with index K and H(K+1) is a standard coefficient with index K+1; and

means coupled to said calculating means for storing the scaled coefficients H'(I).

4,494,215
DISK SYSTEM

Takashi Kolke, Tanashi, and Hajime Sugiura, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 27, 1982, Ser. No. 437,159
Claims priority, application Japan, Oct. 30, 1981, 56-17389
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 6 Claims



1. A disk system, comprising:

a plurality of disk units, each having at least one primary logical volume and one secondary logical volume to which individual machine numbers are assigned;

a plurality of disk controllers;

a plurality of string switching means, each operatively connected to one of said disk controllers, for communicating status information;

two disk control adapters with a cross-call function, connected between said string switching means and said disk units;

double access path means connected between said disk control adapters and said disk units, for connecting said disk units to said disk control adaptors, one of said disk controllers setting an assign bit so as to cause one logical volume of a disk unit to perform a stand-alone operation, the assign bit being reset when another of said disk controllers issues an unconditional reserve command for another logical volume of the disk unit;

a plurality of means, operatively connected to said disk controllers, with one means provided for one logical volume, for storing whether or not a stand-alone operation is performed on the corresponding logic volume and for producing an output;

decoder means, operatively connected to said disk controllers, for decoding the destination of said unconditional reserve command;

a plurality of interruption signal generating means, each operatively connected to one of said storing means and to said decoder means, said interruption signal generating means for issuing an interruption request signal to the corresponding disk controller when said decoder means designates one of said storing means which represents said stand-alone operation; and

notification means (9), operatively connected to one of said disk controllers, to said interruption signal generating means and to said decoder means, for issuing a notification signal for representing the issuance of said interruption request signal to the corresponding disk controller.

4,494,216
MAGNETIC BUBBLE MEMORY DEVICE

Ryo Suzuki; Tadashi Ikeda, both of Kodaira; Masatoshi Takeshita, and Naoki Kodama, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,093
Claims priority, application Japan, Dec. 18, 1981, 56-203715
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 6 Claims

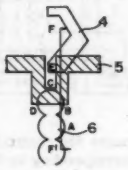
1. A magnetic bubble memory device comprising:

a bubble supporting layer for holding and propagating bubbles of cylindrical magnetic domain;

a first bubble propagation path for propagating the magnetic bubbles in accordance with a driving magnetic field rotating in the plane of said bubble supporting layer, said bubble propagation path being formed in a pattern by ion implantation on the surface of said bubble supporting layer;

a second bubble propagation path for propagating the magnetic bubbles in accordance with said driving magnetic field, said bubble propagation path being formed of a plurality of magnetically soft elements disposed above said bubble supporting layer; and

bubble transfer means for connecting a point on said first bubble propagation path to an end of said second bubble propagation path and for transferring out a bubble of cylindrical magnetic domain having been propagated to

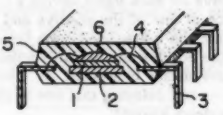


said point through said first bubble propagation path to the end of said second bubble propagation path, said bubble transfer means including a hairpin-shaped conducting layer disposed between said first and second bubble propagation paths and at least in overlapping relation with said point of said first bubble propagation path, said conducting layer being arranged for being supplied with a predetermined amount of electric current for blocking the bubble of cylindrical magnetic domain at said point of said first bubble propagation path until the bubble is repulsed from said point by said driving magnetic field to enable transfer.

4,494,217
SEMICONDUCTOR MEMORIES WITH α SHIELD

Hiroshi Suzuki, Hitachi; Goro Tanaka, Fujisawa; Akio Nishikawa, Hitachi; Junji Mukai, Hitachi; Mikio Sato, Hitachi; Daisuke Makino, Hitachi, and Yoshiaki Wakashima, Kawasaki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,612
Claims priority, application Japan, Jan. 9, 1980, 55-587
Int. Cl.³ G11C *5/00, 11/34*
U.S. Cl. 365—53 17 Claims

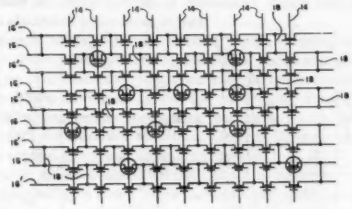


1. In a semiconductor memory device comprising semiconductor memory elements having such a degree of integration in memory circuits as to produce soft errors by incident α-rays, a resin package which packages the memory elements, and an α-rays shielding layer made from a resinous material interposed between the surface of the memory elements and the resin package, said α-shielding layer containing uranium and thorium in a total amount of 1 part per billion or less and having a thickness of at least 40 μm.

4,494,218
READ ONLY MEMORY USING SERIES CONNECTED DEPLETION TRANSISTORS AS BUS LINES

Kenneth L. Naiff, Happauge, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Jun. 1, 1982, Ser. No. 383,755
Int. Cl.³ G11C *5/02, 5/06, 17/00*
U.S. Cl. 365—104 **16 Claims**

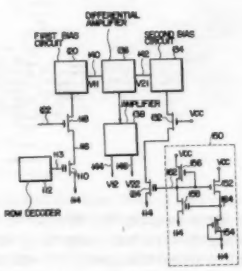


3. A circuit suitable for use as a read only memory comprising first and second spaced groups of series connected transistors, each of said first and second groups defining a sub-circuit which is conductive under normal operating conditions, a third group of series connected potential transistors interposed between said first and second groups, selected ones of said potential transistors being potentially conductive and others being non-conductive under normal operating conditions, means for operably connecting each of said potential transistors in said third group between said first and second groups, means for applying a potential difference between said first and second groups and means for applying a voltage, capable of rendering conductive a potentially conductive transistor, to a potential transistor, such that the presence of an operative electrical connection between said first and second groups can be sensed when said energizing voltage is applied.

4,494,219
NONVOLATILE READ ONLY MEMORY DEVICE

Sumio Tanaka, and Shigeyoshi Watanabe, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 29, 1982, Ser. No. 344,050
Claims priority, application Japan, Feb. 5, 1981, 56-14986
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **9 Claims**

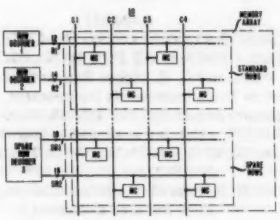


1. A nonvolatile read only memory comprising:
a word line
a nonvolatile memory cell transistor connected at the gate to said word line;
first and second MOS transistors;
first bias circuit for biasing through said first MOS transitor a common read-out node connected to the drain of said memory cell transistor;
a reference cell transistor for detecting a threshold voltage of said memory cell transistor;
a constant potential circuit for applying to the gate of said reference cell transistor a constant voltage which is higher than the threshold voltage of said reference cell transistor and independent of a power source voltage for reading out;
a second bias circuit for biasing through said second MOS transistor the output of said reference cell transistor; and
a differential amplifier for amplifying a difference between voltage signals from said first and second bias circuits.

4,494,220
FOLDED BIT LINE MEMORY WITH ONE DECODER PER PAIR OF SPARE ROWS

Austin C. Dumbri, Easton, and Frank J. Procyk, Center Valley, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 24, 1982, Ser. No. 444,239
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—200 **6 Claims**



1. A semiconductor memory comprising:
an array of standard memory cells arranged in a folded bit line configuration of even and odd rows and columns and an array of spare memory cells arranged in a folded bit line configuration of rows;
a single separate standard row decoder circuit being coupled to each even and to each odd row of standard memory cells, each standard decoder circuit including means for decoupling same from the associated row of standard memory cells;
a single separate spare row decoder circuit being coupled to one even and to one odd row of spare memory cells, each spare decoder circuit includes first means for decoupling same from one or both of the associated rows of spare memory cells; and
each spare row decoder circuit includes second means for providing same with the address of a standard row decoder circuit which has been decoupled from the associated row because of a defect of that row or of the memory cells associated therewith such that the spare row is effectively substituted for the standard row.

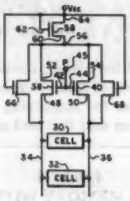
4,494,221
BIT LINE PRECHARGING AND EQUILIBRATING CIRCUIT

Kim C. Hardee, and Rahul Sud, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Filed Mar. 3, 1982, Ser. No. 354,193
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—203 **26 Claims**

18. A method of precharging a pair of bit lines in a semiconductor memory in response to a precharging pulse, the memory having first and second precharging transistors each corresponding to respective first and second bit lines in a pair and each having a gate coupled to receive the precharging pulse, the method comprising the steps of:
turning on only the first precharging transistor in response to

the precharging pulse to apply precharging voltage to only one bit line of the pair; and subsequently



turning on the second precharging transistor to apply precharging voltage to the other bit line of the pair.

4,494,222

PROCESSOR SYSTEM USING ON-CHIP REFRESH ADDRESS GENERATOR FOR DYNAMIC MEMORY

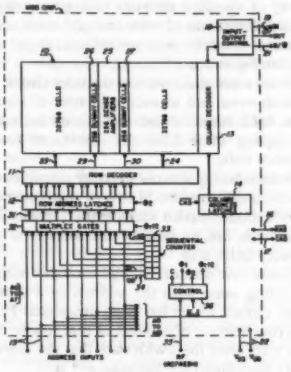
Lionel S. White, and G. R. Mohan Rao, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 135,048, Mar. 28, 1980, Pat. No. 4,344,157, which is a continuation-in-part of Ser. No. 918,891, Jun. 26, 1978, Pat. No. 4,207,618. This application Jul. 26, 1982, Ser. No. 401,688

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—222 **11 Claims**



1. A processing system comprising:

(a) a semiconductor memory device comprising an array of rows and columns of memory cells in a single integrated circuit formed in a semiconductor body, the memory device having a refresh address counter included within said body for generating row addresses along with means for changing the address in the counter to produce a sequence for row addresses including all of the rows within a refresh period and having addressing means for alternatively receiving an address from inputs to the device or from the counter and for accessing the array using said address; and

(b) processing means external to the integrated circuit for generating address signals and coupling them to the inputs of the integrated circuit.

4,494,223

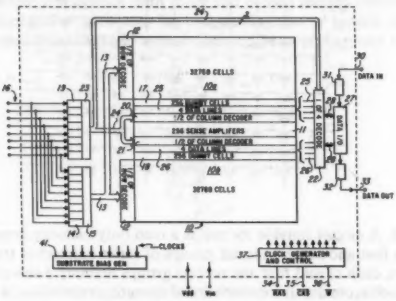
SEQUENTIALLY CLOCKED SUBSTRATE BIAS GENERATOR FOR DYNAMIC MEMORY

Chitranjan N. Reddy, and G. R. Mohan Rao, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1982, Ser. No. 418,899

Int. Cl.³ G11C *13/00, 11/40*

U.S. Cl. 365—233 **10 Claims**



7. A substrate bias generator constructed in a semiconductor chip with a memory circuit or the like which has a plurality of separate sequentially-occuring clock voltages, comprising:

a plurality of separate injector circuits each individually driven by a separate one of said clock voltages to supply substrate bias to said semiconductor chip correlated in time with the clock voltages.

4,494,224

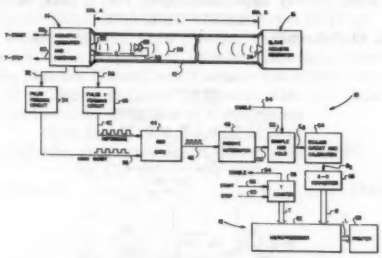
PIPE MEASURING METHOD AND APPARATUS

David J. Morrell, 4330 N. Grandview, No. 1506; Donald G. DeVault, 2731 Chestnut Ave., and William K. Sands, Jr., 2607 Beechwood St., all of Odessa, Tex. 79762

Filed Jul. 16, 1982, Ser. No. 398,972

Int. Cl.³ G01S *15/12*

U.S. Cl. 367—2 **7 Claims**



1. Apparatus for measuring the distance L between two stations in a propagation medium comprising, in combination:

master acoustical transducer means for emitting a burst of acoustical pulses and for receiving acoustical signals in said medium at one of said stations;

slave acoustical transducer means for emitting an acoustical signal in said medium at said other station in response to reception of said burst of acoustical pulses emitted by said master acoustical transducer means;

means for computing the time T which elapses during the interval starting with the emission of said burst of acoustical pulses by said master transducer means and ending with the reception by said master transducer means of an

acoustical signal emitted in response thereto by said slave transducer means;

reference acoustical transducer means for receiving said burst of acoustical pulses at a predetermined distance D from said master acoustical transducer means;

means for generating a first electrical pulse train signal corresponding with said burst of acoustical pulses emitted by said master transducer means;

means for converting said burst of acoustical pulses received by said reference acoustical transducer means into a second electrical pulse train signal;

gate means having first and second inputs coupled to said pulse train signal generating means for receiving said first and second electrical pulse train signals, respectively, said gate means having an output for conducting a pulse train signal characterized by pulses having a width proportional to the duration of coincidence of pulses in said first and second electrical pulse train signals;

integrator means coupled to the output of said gate means for producing a phase angle factor ϕ proportional to the integrated sum of the output pulse train signal of said gate means; and,

computing means coupled to said time computing means and to said integrating means for computing the ratio $L=KfDT/\phi$ where:

L=length between the two stations;

K=calibration constant;

f=pulse repetition frequency of the acoustical burst;

D=distance between the master transducer and the reference transducer;

T=round trip propagation time of sound wave between master transducer and the slave transducer; and,

ϕ=phase angle factor.

4,494,225
OPTICAL DISC REPRODUCING APPARATUS

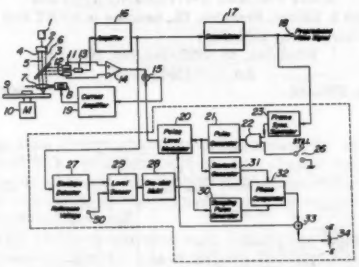
Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 5, 1982, Ser. No. 365,311

Claims priority, application Japan, Apr. 10, 1981, 56-53120

Int. Cl.³ H04N *5/76*; G11B *17/00*

U.S. Cl. 369—44 **10 Claims**



1. In an apparatus for reproducing information recorded on an optical disc as an information signal along spiral or concentric tracks wherein the apparatus includes means for emitting a light beam, means for focusing the light beam onto the optical disc as a light spot, means for rotating the optical disc at a given speed, means for moving said light spot with respect to said disc to produce a light beam modulated in accordance with the information signal in said tracks, means for receiving the modulated light beam to form a reproduced signal, means for producing a returning signal, and means for moving the light spot on said optical disc in response to said returning signal to cause said light spot to repeatedly trace a single track, the improvement in said apparatus comprising:

means responsive to said reproduced signal for generating a first signal representing the actual movement of the light spot with respect to said tracks;

means responsive to said first signal for generating a control signal having a value representing light spot movement by one track pitch; and

means for adjusting the magnitude of said returning signal in response to said control signal so that said returning signal moves said light spot by one track pitch.

4,494,226
THREE BEAM OPTICAL MEMORY SYSTEM

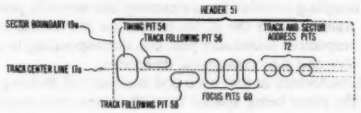
Robert L. Hazel, Thousand Oaks, and Edward V. LaBudde, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1981, Ser. No. 311,629

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.³ G11B *21/12*

U.S. Cl. 369—45 **16 Claims**



1. In an optical recording and reproducing system, the combination comprising:

an optical recording medium having at least one track;

recording means including an optical recording radiation beam for recording optical holes in a predetermined arrangement in a track of said recording medium;

reading means including at least one optical reading radiation beam for reading optical holes in a track of said recording medium, said reading beam having an intensity such that the beam will not disturb the integrity of previously recorded optical holes; and

means providing for relative movement of said beams along said track;

said beams being provided in a manner such that said recording beam traverses the same portions of said medium as said reading beam during said relative movement so that the reflected reading beam is able to provide an advance indication of the suitability of the track for recording by said recording beam; and

means responsive to the reflected reading beam and operative during recording by said recording beam for detecting whether previously recorded optical holes are present ahead of said recording beam and if so for preventing said recording beam from recording over said previously recorded optical holes.

4,494,227
STEREO PHONO PICK-UP AND/OR CUTTER

Casper E. G. M. M. van Vroonhoven, and Keimpe van Wijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,354

Claims priority, application Netherlands, Apr. 13, 1981, 8101794

Int. Cl.³ H04R *9/16*

U.S. Cl. 369—147 **12 Claims**

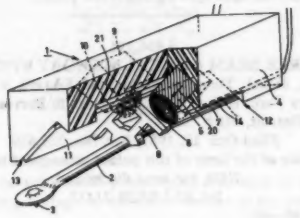
1. A cartridge for scanning and/or recording information in two orthogonal directions of vibration in a track of a record carrier, comprising:

a cartridge stationary part,

a stylus holder, mounted to said stationary part for movement in said two orthogonal directions in a plane perpendicular to the track of a record carrier, and having an end and a stylus carried at said end,

two transducers, each having a magnetic circuit including a

respective transducer magnet part having a magnetic axis and a respective transducer coil part having a coil axis, said axes of the respective parts of a transducer being substantially coincident, one of the respective parts of each transducer being mounted for movement relative to the other part along the respective axis, and



a coupling member for connecting the movable part of each transducer to the stylus holder for movement along the respective transducer part axis corresponding to a respective one said orthogonal directions,

characterized in that each coil is a flat coil defining a plane, the plane being spaced from the respective magnet.

4,494,228

ORTHOGONAL CODE DIVISION MULTIPLE ACCESS COMMUNICATIONS SYSTEMS

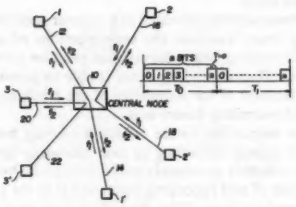
Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 12, 1982, Ser. No. 407,409

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ H03K *13/01*; H04J *1/04*

U.S. Cl. 370—18 **21 Claims**



6. An orthogonal code division multiple access communication system, including a plurality of users comprising in combination:

a plurality of transceivers utilized by said users and being simultaneously operable during the same time period with different multiplexed noise codes which compress to an impulse upon autocorrelation and additionally having crosscorrelation functions equal to zero at a time when said noise codes autocorrelate to an impulse.

4,494,229

INTERCONNECTING APPARATUS FOR A DISTRIBUTED SWITCHING TELEPHONE SYSTEM

Charles H. Jolissaint, Sunnyvale, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

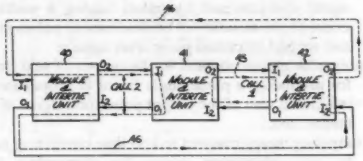
Continuation of Ser. No. 054,008, Jul. 2, 1979, abandoned. This application Dec. 16, 1981, Ser. No. 331,383

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—58 **8 Claims**

1. In a time division telphone switching system employing a plurality of switching modules, each of said modules interconnecting with a plurality of communication lines such as station lines and trunk lines, said modules for concentrating signals on said lines into time division multiplex digital signals and for switching said signals between said lines, an improved interconnecting system for interconnecting said modules comprising:

a plurality of intertie units, one for each of said modules, each of said units having a first and second intertie input port for receiving signals from other units and a first and second intertie output port for communicating signals to other of said units, each of said units being coupled to receive and communicate signals to its respective switching module;



first interconnecting lines for interconnecting said second output port of said first of said units to said first input port of the second of said units and for connecting said second output port of said second of said units to said first input port of said third of said units, and for connecting the second output port of the last of said units to said first input port of said first unit;

second interconnecting lines for connecting said second input port of said first unit to said first output port of said second unit and for connecting said second input port of said second unit to said first output port of said third unit, and for connecting said second input port of said last unit to said first output port of said first unit;

whereby efficient and reliable interconnections between said modules is realized.

4,494,230

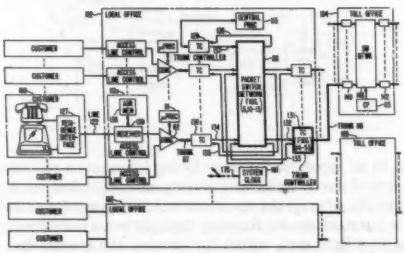
FAST PACKET SWITCHING SYSTEM

Jonathan S. Turner, Evanston, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1982, Ser. No. 393,112

Int. Cl.³ H04J *6/00*

U.S. Cl. 370—60 **46 Claims**



1. A fast packet switching system for switching packets for a plurality of messages from a plurality of transmission links comprising;

a packet switching network having a plurality of interconnected packet switch nodes,

a plurality of distributed controllers each for interfacingly connecting an individual one of said transmission links to one of said packet switch nodes and comprising,

memory means for storing translation information for controlling the routing of packets of one of said messages communicated over said one of said links through a plurality of said switch nodes to another of said controllers, and

means for concatenating translation information stored in said memory means with said packets of said one of said messages to produce a plurality of address bits,

and

said one of said switch nodes comprising

a plurality of input conductors,

a plurality of output conductors,

a plurality of output conductors,

means responsive to a predetermined number of said plurality of address bits from one of said input conductors for routing a received packet of said one of said messages from said one of said input conductors to one of said output conductors defined by said predetermined number of address bits, and

means for repositioning said predetermined number of address bits in said plurality of address bits in the routing of said received packet to said defined one of said output conductors.

4,494,231

TIME DIVISION SWITCHING SYSTEM FOR CIRCUIT MODE AND PACKET MODE CHANNELS

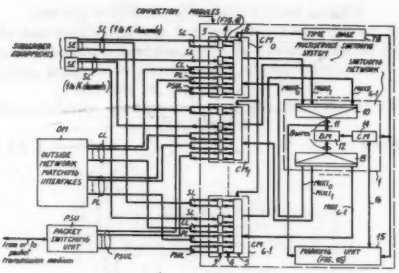
Serge Slawy, Kergavant; Olivier F. Louvet, 22, av. de Normandie Keruhel, and Jean L. Dauphin, 70, Residence Corlay, all of Lannion, France (22300)

Filed Jan. 15, 1982, Ser. No. 339,880

Claims priority, application France, Jan. 23, 1981, 81 01327

Int. Cl.³ H04J 6/00

U.S. Cl. 370—60 **17 Claims**



1. A time division digital switching system for switching channels with a predetermined rate, said channel having circuit mode channels and packet mode channels conveying useful information words with a predetermined number of bits, said system comprising:

G first multiplexing means, each multiplexing a group of I reception channels into an outgoing multiplexed signal, G first demultiplexing means each demultiplexing an incoming multiplexed signal into a group of I emission channels, of said multiplexed signals having a recurrent frame including I useful information words assigned to said multiplexed channels, where G and I are integers greater than one; and

means for bidirectionally switching said circuit mode channels and said packet mode channels between lines carrying said incoming and outgoing multiplexed signals; each of said first multiplexing means comprising:

means for introducing working information words into predetermined time intervals, each of the information words defining a multiframe and being included in one of I consecutive frames of said outgoing multiplexed signal words, each of said information words having said predetermined number of bits respectively assigned to said I reception channels, said incoming multiplexed signals also conveying said frames and multiframes; and

means for detecting flag/packet transitions in said packet mode reception channels to replace the working information word by a flag/packet transition indicating word in a frame of said outgoing multiplexed signal having the same rank in the multiframe as that in said packet mode reception channel in which a flag/packet transition has been detected;

said switching means comprising means receiving the working information words multiplexed in the multiframes of said outgoing multiplexed signals for detecting the transition indicating word to switch the channel having a detected transition over to a free packet mode channel in an incoming multiplexed signal.

4,494,232

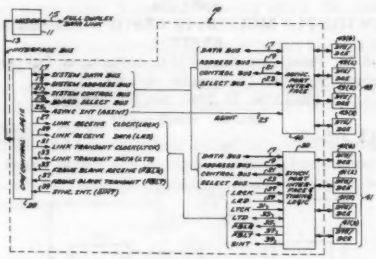
STATISTICAL MULTIPLEXER WITH DYNAMIC BANDWIDTH ALLOCATION FOR ASYNCHRONOUS AND SYNCHRONOUS CHANNELS

William A. Dambrackas, Miami; Michael B. Marshall, Ft. Lauderdale; Larry S. Greenstein, Miami, and Alex Downie, Cooper City, all of Fla., assignors to Racal-Milgo, Inc., Miami, Fla.

Filed Dec. 4, 1981, Ser. No. 327,495

Int. Cl.³ H04J 6/02

U.S. Cl. 370—80 **12 Claims**



1. Multiplexer apparatus for use with a data link and having a means for interfacing with a plurality of asynchronous data devices, and a means for generating asynchronous data frames in response to data from the asynchronous data devices, said multiplexer apparatus comprising:

synchronous data port means for interfacing with a plurality of synchronous data equipment, said synchronous data port means providing bidirectional communication with said synchronous data equipment;

control means for allocating link bandwidth to any one of the synchronous data equipment in response to the need for any one of the synchronous data equipment to have bandwidth, and for deallocating bandwidth from any one of the synchronous data equipment when bandwidth is no longer required, said control means further generating control frames for transmission over the data link; and

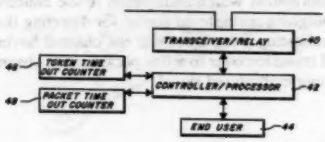
means for interleaving synchronous data bits from the synchronous data equipment having bandwidth with asynchronous data frames and with said control frames to form composite link data.

4,494,233

METHOD AND APPARATUS FOR THE DETECTION AND REGENERATION OF A LOST TOKEN IN A TOKEN BASED DATA COMMUNICATIONS NETWORK

Richard G. Bahr, Framingham, and Paul B. Cohen, Ashland, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1983, Ser. No. 466,109
Int. Cl.³ H04Q 9/00
U.S. Cl. 370—86 10 Claims



1. In a token-passing, ring-based data communications network, a method for the detection and regeneration of a lost token comprising the steps of

monitoring the communication network at each node having a pending packet transmission for detecting the loss of the token,

transmitting, at each monitoring node detecting the loss of the token, a data packet without a token, said data packet uniquely identifying the transmitting node as the source,

stripping, at each such transmitting node, all incoming data from the network,

transmitting a new token upon successful receipt of its transmitting data packet by the node which transmitted it, and

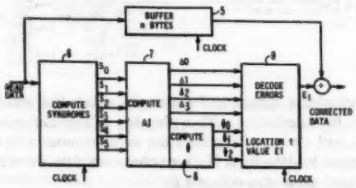
instituting a node transmission arbitration method if the transmitted data packet is not received within a predetermined time out period.

4,494,234

ON-THE-FLY MULTIBYTE ERROR CORRECTING SYSTEM

Arvind M. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,393
Int. Cl.³ G06F 11/10
U.S. Cl. 371—38 19 Claims



1. A multibyte error correcting system operable to detect up to t errors in a selected codeword containing up to 2^b character positions, where each character is represented by a byte consisting of a unique combination of "b" binary bits, by processing 2t syndrome bytes, each containing "b" bits which were generated by combining write check bytes and read check bytes generated respectively when data is written into and read from a storage medium, said check bytes corresponding to the modulo 2 sum of bit positions of said codeword that were selected systematically in accordance with a parity check matrix reflecting the roots α^a, α^{a+1}, α^{a+2}, . . . , α^{a+2t-1} of a generator polynomial where α is an element of the finite field of 2^b elements, said system including:

syndrome generating means for generating 2t syndrome bytes from said selected codeword as it is read from the storage medium into said system;

clocking means for effecting concurrent serial transfer of each byte of said selected codeword read out of said system and each byte of the next codeword read from the storage medium into said system during each clock cycle; and

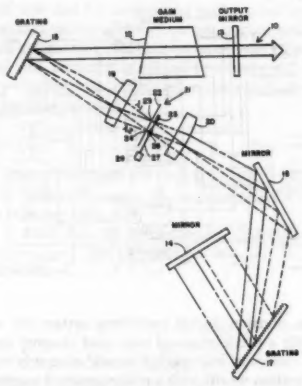
error correcting means responsive to said 2t syndrome bytes for correcting during said serial byte transfer from said system up to t erroneous bytes in said selected codeword as said next codeword is entered into said system whereby said selected codeword and said next codeword are processed in a continuous stream of serial bytes.

4,494,235

MULTIPLE WAVELENGTH LASER

Steve Guch, Jr., Saratoga; Phillip J. Gardner, Cupertino, both of Calif.; Leonard W. Braverman, Moorestown, N.J., and Robert W. Jones, San Jose, Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 536,566, Sep. 27, 1983, , which is a continuation-in-part of Ser. No. 257,056, Apr. 24, 1981,. This application May 3, 1984, Ser. No. 606,543
Int. Cl.³ H01S 3/098
U.S. Cl. 372—23 9 Claims



1. A laser system comprising;

a lasing medium pumped to produce a laser beam,

feedback and output reflectors spaced from opposite ends, respectively, of said medium and defining the laser cavity for circulating said laser beam along its axis and between said reflectors, and

a wavelength selection assembly in said cavity comprising:

means to disperse said laser beam into a plurality of sub-beams having axes different from each other and from said beam axis and to focus the sub-beams on a focal plane whereby optically to transform to the focal plane the spatial distribution of the sub-beams at infinity,

a mask in said focal plane having a plurality of apertures at the foci, respectively, of said sub-beams, and

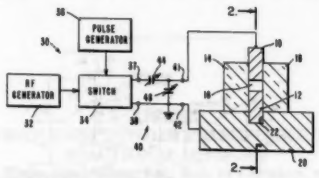
means for selectively opening at least one of said apertures and closing others whereby the laser resonates at the wavelength of the sub-beam passing through said one aperture.

4,494,236

PULSED RF PUMPED WAVEGUIDE LASER

Leroy V. Sutter, Jr., Culver City, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jul. 26, 1979, Ser. No. 61,082
Int. Cl.³ H01S 3/10
U.S. Cl. 372—25 6 Claims



1. A waveguide laser comprising:

means defining an elongated chamber of cross-sectional dimensions suitable for guiding laser light;

a laser gas disposed in said chamber; and

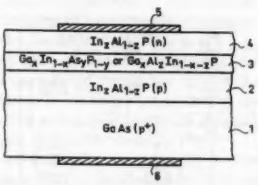
means for providing an excitation electric field in said chamber along a direction transverse to the length thereof to establish a laser-exciting discharge in said laser gas, said excitation electric field consisting of a series of bursts of an alternating electric field at a frequency ranging from about 30 MHz to about 3 GHz, said bursts having a duration ranging from about 0.1 μsec. to about 10 μsec. and a repetition rate ranging from about 500 Hz to about 100 kHz.

4,494,237

SHORTWAVE SEMICONDUCTOR LASER

Marie-Antoinette Di Forte Poisson; Jean-Pierre Hirtz; Jean-Pascal Duchemin, and Baudouin de Cremoux, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 16, 1982, Ser. No. 388,995
Claims priority, application France, Jun. 19, 1981, 81 12143
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 6 Claims



1. A semiconductor device comprising:

a GaAs substrate of a predetermined conductivity type and at least the following epitaxial layers: a first confinement layer of the same conductivity type as the substrate, an active layer and a second confinement layer of opposite conductivity type, the confinement layers being constituted by materials having a wider forbidden band than that of the active layer, the material constituting the active layer being formed of an alloy corresponding to the formula:

$$Ga_xIn_{1-x}As_yP_{1-y}$$

where x has a value between zero and one, y has a zero value or a value between zero and one, x and y being determined with respect to each other by the relation varified to within 1%:

$$y=(0.42x-0.22)/(0.01x+0.19)$$

and the confinement layers being formed of an alloy corresponding to the formula:

$$In_zAl_{1-z}P$$

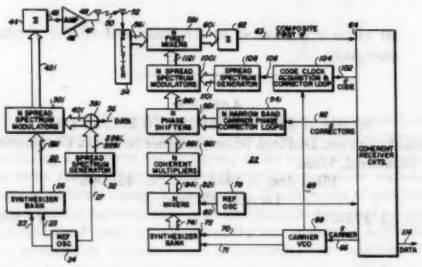
with: $0.45 \leqq z \leqq 0.49$.

4,494,238

MULTIPLE CHANNEL DATA LINK SYSTEM

Edward J. Groth, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1982, Ser. No. 393,833
Int. Cl.³ H04B 7/02
U.S. Cl. 375—1 32 Claims



23. A receiver for receiving a plurality of coherently related radio frequency signals, the plurality of radio frequency signals being one of contiguous and non-contiguous, the radio frequency signals each being modulated with an information bearing signal, said information bearing signals being identical each to every other information bearing signal, the receiver comprising:

a single dynamic, carrier tracking, phase locked loop for maintaining all of the received signals coherent;

means coupled into said phase locked loop for coherently and simultaneously combining at least two of the received radio frequency signals; and

means coupled into said phase locked loop for detecting said combined signals, said means for detecting being responsive to said combined radio frequency signals subsequent to said combining.

4,494,239

FRAME SYNCHRONIZATION AND PHASE AMBIGUITY RESOLUTION IN QAM TRANSMISSION SYSTEMS

Gary D. Martin, Andover, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

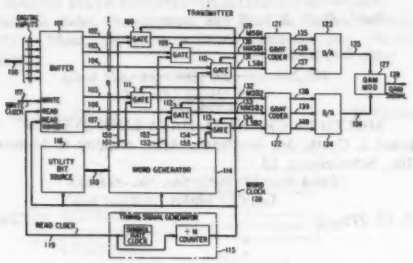
Filed May 26, 1982, Ser. No. 382,176
Int. Cl.³ H03C 5/00; H04B 15/00
U.S. Cl. 375—39 16 Claims

1. Apparatus for use in a QAM system wherein at least two channels of nondifferentially encoded data modulate the amplitudes of quadrature-related carriers, said data being sensitive to rotational effects of phase ambiguity, said apparatus being characterized by

means (114, 115) for forming multibit words (F_I,F_Q) each comprising at least one framing bit having a predetermined value, and

means (115, 108, 109, 110, 111, 112, 113) for inserting said words at selected times within said channels with said framing bit in a predetermined bit position, said words inserted together at each of said selected times forming a data point in a symmetrical subset of data points in a signal space diagram, all of the subset data points have said

predetermined value in said predetermined bit position for each of said words inserted together, whereby the framing



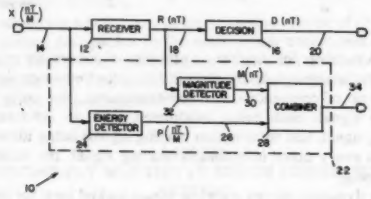
bit value is insensitive to the rotational effects of phase ambiguity.

4,494,240

MODEM END OF MESSAGE DETECTOR

John L. Payton, Dedham, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Jan. 3, 1983, Ser. No. 455,306
Int. Cl.³ H03K 5/20
U.S. Cl. 375—75 **7 Claims**



1. In modem apparatus having receiver circuitry which demodulates a received carrier into a sequence of received signals and decodes each said signal into a signal point drawn from a predetermined signal point alphabet, said received carrier being modulated in accordance with a sequence of said signal points representing a message,

that improvement comprising circuitry for estimating the receipt of the end of said message by testing each said received signal against a predetermined end-of-message condition and wherein said signal point alphabet includes a non-data signal point for indicating the end of said message, and said end-of-message condition comprises said received signal being within a predetermined distance of said non-data signal point.

4,494,241

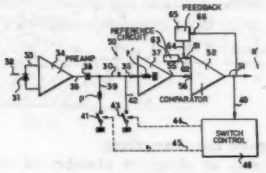
INSTALLATION FOR THE TRANSMISSION OF INFORMATIONS BY AN OPTICAL BUS LINE

Jean-Jacques Mayoux, Boulogne Billancourt, France, assignor to Electronique Marcel Dassault, Paris, France

Filed Jan. 13, 1981, Ser. No. 224,810
Claims priority, application France, Jan. 14, 1980, 80 00729
Int. Cl.³ H03K 9/02
U.S. Cl. 375—76 **15 Claims**

1. Apparatus for wave shaping signals transmitted as successive electrical input pulse trains, comprising centering means for substantially centering each input pulse train with respect to a reference level regardless of the pulse amplitude of the input pulse train or of any preceding input pulse train, and wave shaping means for producing a wave-shaped signal in response to said centered pulse train, said centering means comprising

a capacitor-resistor circuit including a capacitor, a resistor joined to said capacitor, and a first switch in series with the resistor forming a resistor path to ground, a low pass filter and limiter amplifier having an input connected to a junction of said capacitor and said resistor, and envelope detector means delivering an envelope signal covering the duration of each train, but with a time lag after the beginning of the train, the time lag being shorter than the duration of any pulse in the train, said first switch being controlled to open in response to said envelope signal, with said capacitor and resistor having values selected such that said capacitor-resistor circuit charges the capacitor thereof to substantially half the amplitude of the first incoming pulse of the train, and the voltage across the capacitor thereafter provides a centering of the remaining pulses of the train about said reference voltage.

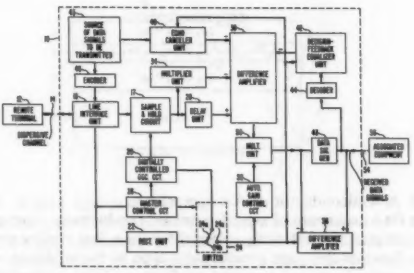


4,494,242

TIMING RECOVERY IN A BAUD-RATE SAMPLED-DATA SYSTEM

Christine H. Ehrenbard, New York, N.Y., and Noah L. Gottfried, Franklin Lakes, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 30, 1982, Ser. No. 413,157
Int. Cl.³ H04L 7/00
U.S. Cl. 375—118 **8 Claims**



1. In combination in a baud-rate sampled-data terminal adapted to be connected to a dispersive channel,

means responsive to data pulses from said channel for sampling each such pulse at said baud-rate to provide a relatively low-amplitude sampled level representative of a low-amplitude non-zero point on the precursor of said pulse and a relatively high-amplitude sampled level representative of the peak or a near-peak point of said same pulse,

means responsive to the output of said sampling means for delaying each of said sampled levels by one sampling interval,

means also responsive to the output of said sampling means

for multiplying each of said sampled levels by a fixed factor that is the ratio of said low-amplitude level to said high-amplitude level when sampling of pulses is occurring in a prespecified correctly timed manner, and

means for comparing the delayed low-amplitude level with the multiplied version of the high-amplitude level to provide an indication of whether or not sampling is occurring in the prespecified manner.

4,494,243

FREQUENCY DIVIDER PRESETTABLE TO FRACTIONAL DIVISORS

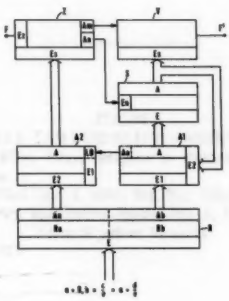
Herbert Elmis, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 16, 1982, Ser. No. 442,055

Claims priority, application European Pat. Off., Nov. 26, 1981, 81-10-9922.5

Int. Cl.³ H03K *21/36*; G06F *7/68*

U.S. Cl. 377—48 **1 Claim**



1. Frequency divider presettable to fractional divisors (c/e) and including a counter (Z) presettable to integers,

characterized by the following features:

Those stages (Rb) of a divisor register (R) holding the fractional parts (b) of the divisor (c/e) in decimal point representation (a+0.b) are connected to the first input (E1) of a first adder (A1) having its output (A) coupled to the input of a buffer memory (S);

the output of the buffer memory (S) is coupled to the second input (E2) of the first adder (A1) and to the set input (Es) of a digitally adjustable delay line (V) whose setting-step width is equal to the period (T) of the divider input signal (F) divided by the nominator (e) of the divisor (c/e), and whose input is connected to the maximum-count output (Am) of the counter (Z), and

the overflow (Ao) of the first adder (A1) is coupled to the least significant digit (LB) of the first input (E1) of a second adder (A2), whose second input (E2) is connected to those stages (Ra) of the divisor register (R) holding the integral parts (a) of the divisor (c/e), and whose output (A2) is coupled to the set input (Es) of the counter (Z), and the enable input (En) of the buffer memory (S) is connected to one of the count outputs (An) of the counter (Z), which lie before the maximum-count output (An).

4,494,244

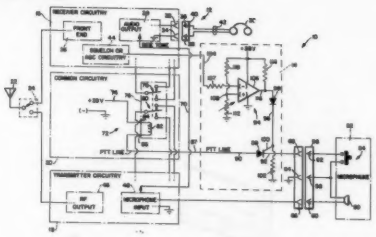
STEP-OFF DEVICE FOR AIRCRAFT VOICE COMMUNICATION SYSTEM

Alfred Arndt, R.D. 4 Box 346, and John G. Rutty, R.D. 5, Box 292, both of Hanover, Pa. 17331

Filed Feb. 14, 1983, Ser. No. 466,318

Int. Cl.³ H04B *1/44*

U.S. Cl. 455—78 **8 Claims**



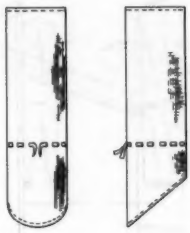
5. A step-off device for retrofit connection to a voice communication radio of the type including radio receiver circuitry providing a received audio signal; radio transmitter circuitry; the radio receiver circuitry and the radio transmitter circuitry being selectively operable on any one of a plurality of predetermined radio frequency channels; and including ground connection-activated push-to-talk circuitry for manually activating the transmitter circuitry and deactivating the receiver circuitry; the push-to-talk circuitry in turn being of the type including a voltage supply line providing supply voltage with reference to a circuit reference node, a controlled switching element having an output portion operably connected for selectively activating the transmitter circuitry and deactivating the receiver circuitry and having a control input portion with a pair of input terminals for activating the output portion when at least a predetermined input current level flows through the input portion between the input terminals, a connection between one of the pair of switching element input terminals and the voltage supply line, and a push-to-talk control terminal connected to the other of the pair of switching element input terminals and arranged for connection to a manually-operable push-to-talk switch for completing a series electrical circuit to the circuit reference node for activating the controlled switching element; said step-off device comprising:

a thyristor having a pair of main terminals and a gate terminal for triggering conduction between said main terminals, said thyristor main terminals being electrically interposed in series between the push-to-talk control terminal and the push-to-talk switch such that the transmitter circuitry can be activated only when said thyristor is conducting;

a triggering circuit having an input connected to sense the received audio signal and having an output connected to said thyristor gate terminal, said triggering circuit operable to supply a gating signal to said thryistor gate terminal only when the received audio signal level is below a predetermined threshold level; and

a power supply circuit for supplying operating voltage to said triggering circuit, said power supply circuit including a connection to the push-to-talk control terminal for deriving voltage from the voltage supply line through the control input portion of the controlled switching element during those periods of operation when the controlled switching element is not actuated, and including a series-connected current-limiting impedance for limiting current through said power supply circuit to a level below the predetermined input current level of the controlled switching element.

277,139
HAIR RETAINER HEAD WEAR
Florence R. DeFalco, 436 Cherry Hill Rd., Dyer, Ind. 46311
Filed Dec. 22, 1982, Ser. No. 439,771
Term of patent 14 years
U.S. Cl. D2—249



277,140
PULL TAB FOR SLIDE FASTENER
Shunji Abe, Milan, Italy, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Dec. 7, 1981, Ser. No. 328,259
Claims priority, application Japan, Jun. 5, 1981, 56-24291
Term of patent 14 years
U.S. Cl. D2—415

277,141
TOOTHBRUSH
James O'Halloran, Tortola, V.I., assignor to Radius Corporation, New York, N.Y.
Filed Sep. 30, 1982, Ser. No. 430,122
Term of patent 14 years
U.S. Cl. D4—111

277,142
FOLDING MUSIC STAND
John E. Scofield, P.O. Box 1184, Greenwich, Conn. 06830
Filed Sep. 13, 1982, Ser. No. 417,137
Term of patent 14 years
U.S. Cl. D6—419

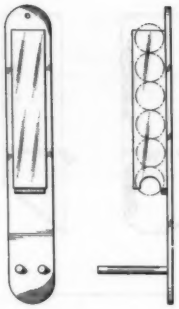
277,143
CHAIR
Charles D. Helmboldt, Caledonia Township, Kent County, Mich., assignor to Haworth Mfg., Inc., Holland, Mich.
Filed Sep. 29, 1980, Ser. No. 191,601
The portion of the term of this patent subsequent to Nov. 27, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

277,144
CHAIR
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,798
The portion of the term of this patent subsequent to Jul. 31, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

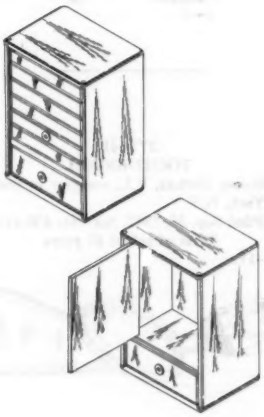
277,145
SEAT
Gianbattista Giudici, Seveso, Italy, assignor to Altena Salotti s.r.l., Cabiate, Italy
Filed Sep. 3, 1982, Ser. No. 414,539
Claims priority, application Italy, Mar. 9, 1982, 21081 8/82
Term of patent 14 years
U.S. Cl. D6—381

277,146
WALL-MOUNTED SOAP DISH
Jersy Boroch, Saint Ismier, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,823
Claims priority, application France, Oct. 15, 1981, DM/000-978
Term of patent 14 years
U.S. Cl. D6—540

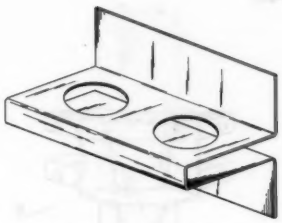
277,147
WALL MOUNTED STORAGE RACK FOR A TABLE TENNIS SET
Kenneth S. Shellman, Sr., 3615 E. 3rd. St., Dayton, Ohio 45403
Filed Sep. 29, 1982, Ser. No. 428,014
Term of patent 14 years
U.S. Cl. D6—515



277,148
WALL MOUNTED CABINET
James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.
Filed Apr. 22, 1982, Ser. No. 370,954
Term of patent 14 years
U.S. Cl. D6—560

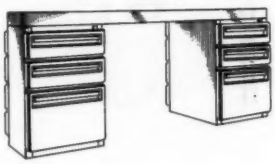


277,149
SHELF
Ronald W. Hind, 7 Graybridge Dr., St. Louis, Mo. 63124
Filed May 5, 1982, Ser. No. 375,310
Term of patent 14 years
U.S. Cl. D6—574

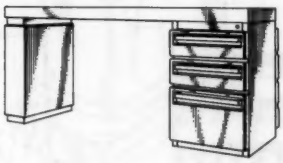


277,150
RECESSED WARDROBE CABINET
David L. Tebbe, St. Clair, and Steven R. Shelton, Union, both of Mo., assignors to Lane Craft Industries, Inc., St. Louis, Mo.
Filed Jan. 22, 1982, Ser. No. 341,326
Term of patent 14 years
U.S. Cl. D6—446

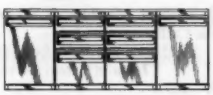
277,151
DESK
Bruce R. Hannah, Cold Spring, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 153,870, May 28, 1980, Pat. No. Des. 270,409. This application Feb. 22, 1983, Ser. No. 468,376
Term of patent 14 years
U.S. Cl. D6—423



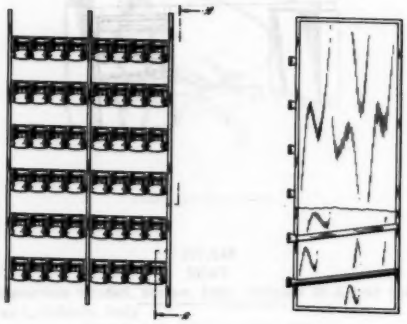
277,152
DESK
Bruce R. Hannah, Cold Spring, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 153,870, May 28, 1980, Pat. No. Des. 270,409. This application Feb. 22, 1983, Ser. No. 468,375
Term of patent 14 years
U.S. Cl. D6—423



277,153
CREDENZA
Bruce R. Hannah, Cold Spring, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 153,870, May 28, 1980, Pat. No. Des. 270,409. This application Feb. 22, 1983, Ser. No. 468,378
Term of patent 14 years
U.S. Cl. D6—446

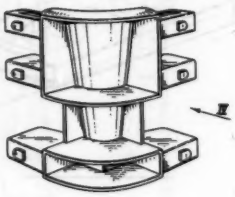


277,154
COMBINED OIL CAN DISPLAY AND DISPENSER RACK
Donald D. Nasgowitz, Milwaukee, Wis., assignor to DCI Marketing, Milwaukee, Wis.
Filed Mar. 29, 1982, Ser. No. 362,764
Term of patent 14 years
U.S. Cl. D6—408

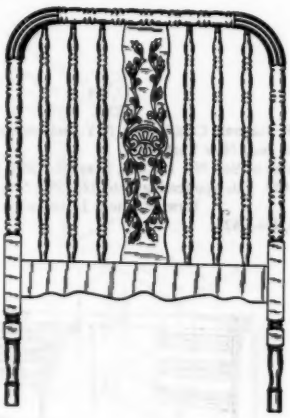


277,155
DISPLAY UNIT FOR A VIDEO GAME SYSTEM OR THE LIKE
Sydney Edson, East Meadow, N.Y., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Aug. 25, 1982, Ser. No. 411,797
Term of patent 14 years
U.S. Cl. D6—467

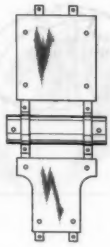
277,156
CORNER CONNECTOR FOR USE IN THE CONSTRUCTION OF A DRAWER
Terence Hardy, Nether Heage, England, assignor to L. B. (Plastics) Limited, Belper, England
Filed May 24, 1982, Ser. No. 381,283
Claims priority, application United Kingdom, Nov. 26, 1981, 1003817
Term of patent 14 years
U.S. Cl. D6—510



277,157
CRIB END
Henry W. Mower, Stevens Point, Wis.; Allen Seymour, Clayton, Ohio; Jerome P. Koziatek, Hinckley, Ohio, and Joseph G. Lendvay, Ravenna, Ohio, assignors to Questor Corp., Tampa, Fla.
Filed Jun. 24, 1982, Ser. No. 391,944
Term of patent 14 years
U.S. Cl. D6—506

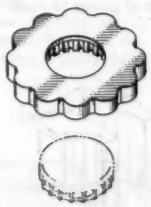


277,158
UTILITY CUSHION
Charles R. Baylor, 2808 Billy B. St., Arlington, Tex. 76010, and Curtis Cannon, 3041 Walnut Hill La. Apt. 1226, Irving, Tex. 75062
Filed Jun. 23, 1982, Ser. No. 391,147
Term of patent 14 years
U.S. Cl. D6—596

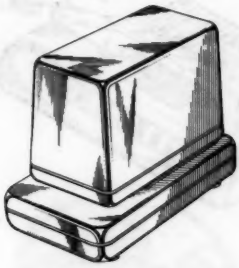


277,159
UPPER SURFACE DECORATION FOR A PLATE OR SIMILAR ARTICLE
Simone Colquitt, Bronxville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,171
Term of patent 14 years
U.S. Cl. D7—39

277,160
BOTTLE OPENER
Howard J. Antone, 12284 Adine Ct., Glen Ellen, Calif. 95442
Filed Jun. 7, 1982, Ser. No. 385,458
Term of patent 14 years
U.S. Cl. D8—40

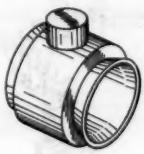


277,161
POWERED STAPLER
David B. Miller, Old Greenwich, Conn.; Paul Olesen, Bellmore, and Ion Stoica, New York, both of N.Y., assignors to Swingline Inc., Long Island City, N.Y.
Filed Oct. 5, 1982, Ser. No. 432,800
Term of patent 14 years
U.S. Cl. D8—49

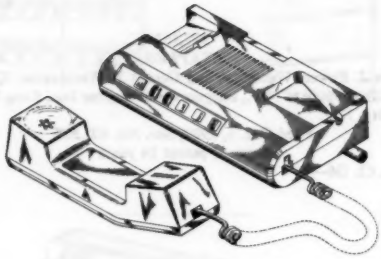


277,162
STAPLER
John J. Power, Westbury, and Gerald T. Washington, Queens Village, both of N.Y., assignors to Swingline Inc., Long Island City, N.Y.
Filed Oct. 4, 1982, Ser. No. 432,555
Term of patent 14 years
U.S. Cl. D8—50

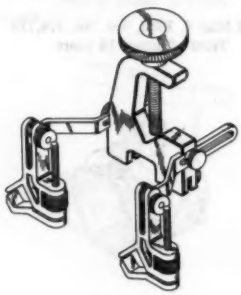
277,163
COMBINED CABLE CONNECTOR AND CRIMPING TOOL
Charles P. Lankford, III, 33985 Hummingbird Dr., Elizabeth, Colo. 80107
Filed May 4, 1982, Ser. No. 374,719
Term of patent 14 years
U.S. Cl. D8—51



277,164
CONTROL CONSOLE FOR A MOBILE TELEPHONE WITH HANDSET
Ernest M. Bevilacqua, Wilton, Conn., assignor to Oki Electric Overseas Corporation, Hackensack, N.J.
Filed Sep. 7, 1982, Ser. No. 415,219
Term of patent 14 years
U.S. Cl. D8—53

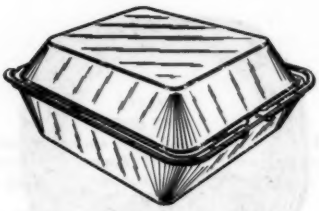


277,165
SUPPORT CLAMP
William A. DeVroom, Glendora, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 31, 1981, Ser. No. 297,654
Term of patent 14 years
U.S. Cl. D8—72



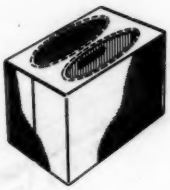
277,166
DUAL KNIFE SHARPENER WITH DUAL HANDLE
Daniel D. Call, Athens, Wis., assignor to Oy Fiskars AB, Helsinki, Finland
Filed Dec. 29, 1982, Ser. No. 454,440
Term of patent 14 years
U.S. Cl. D8—93

277,167
PACKAGING CONTAINER
Kenneth B. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.
Division of Ser. No. 246,029, Mar. 20, 1981,. This application Sep. 19, 1983, Ser. No. 533,574
Term of patent 14 years
U.S. Cl. D9—347

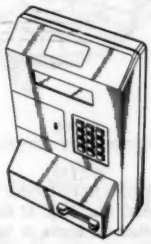


277,168
PAD HOLDING INSERT FOR AN AUDIO CASSETTE CLEANER
Eivind Clausen, and James D. Allsop, both of Bellingham, Wash., assignors to Allsop, Inc., Bellingham, Wash.
Filed Jan. 7, 1982, Ser. No. 337,771
Term of patent 14 years
U.S. Cl. D8—394

277,169
DISPENSING CARTON FOR SHEET MATERIAL
John M. Ito, Cheltenham, Canada, and James D. Cotton, Livonia, Mich., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 1, 1982, Ser. No. 364,386
Term of patent 14 years
U.S. Cl. D9—418

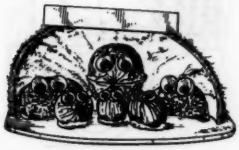


277,170
COMBINED TIME RECORDER AND DATA COLLECTION SYSTEM
Yoshihiko Sugiyama, Nara, and Ken Kawamura, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 27, 1982, Ser. No. 452,987
Claims priority, application Japan, Jul. 20, 1982, 57-33012
Term of patent 14 years
U.S. Cl. D10—41

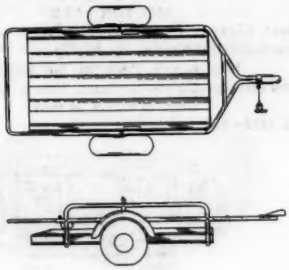


277,171
BRACELET OR THE LIKE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Dec. 30, 1981, Ser. No. 335,747
Claims priority, application Italy, Jul. 2, 1981, 35897/81[U]
Term of patent 14 years
U.S. Cl. D11—3

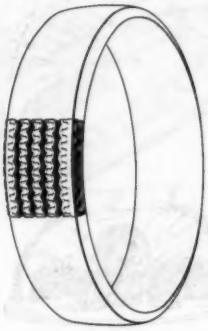
277,172
ORNAMENT FOR TABLE OR OTHER SUPPORTING SURFACE
Frank Deeley, Villa Coolins, Ilsham Marine Dr.; Lawrence Deeley, 45 Broadley Dr., and Kevin Burnett, 11a Braddons Hill Rd. West, all of Torquay, Devon, England
Filed Jul. 14, 1982, Ser. No. 398,270
Claims priority, application United Kingdom, Jan. 15, 1982, 1004628
Term of patent 14 years
U.S. Cl. D11—158



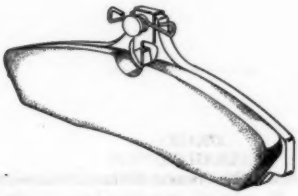
277,173
TRAILER
Allan G. Jenkins, 16 Catalina Crescent, Milford, Auckland, New Zealand
Filed Sep. 15, 1982, Ser. No. 418,481
Claims priority, application New Zealand, Mar. 25, 1982, 17601
Term of patent 14 years
U.S. Cl. D12—101



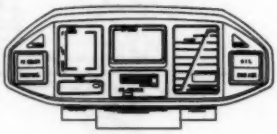
277,174
TIRE TREAD AND BUTTRESS
A. Robert Casimiro, Akron, and Bill J. Wallet, Marshallville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Sep. 17, 1982, Ser. No. 419,335
Term of patent 14 years
U.S. Cl. D12—142



277,175
DISC BRAKE PAD UNIT
Dimitri Caplygin, Sydney, Australia, assignor to Girlock Limited, Belmore, Australia
Filed Mar. 30, 1982, Ser. No. 363,483
Term of patent 14 years
U.S. Cl. D12—180



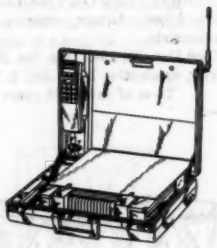
277,176
INSTRUMENT PANEL AND HOUSING FOR A MOTORCYCLE
Katsusuke Komuro, Chofu, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 5, 1982, Ser. No. 405,704
Claims priority, application Japan, Feb. 5, 1982, 57-4642
Term of patent 14 years
U.S. Cl. D12—192



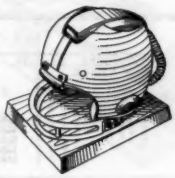
277,177
CONTINUOUS ELECTRICAL TRACK SYSTEM
Michael Humphreys, London, England, assignor to Electrak International, Ltd., London, England
Filed Feb. 3, 1982, Ser. No. 345,319
Claims priority, application United Kingdom, Aug. 6, 1981, 1001839
Term of patent 14 years
U.S. Cl. D13—13

277,178
RECORD PLAYER
Masakatsu Morita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 25, 1982, Ser. No. 392,204
Claims priority, application Japan, Dec. 29, 1981, 56-58767
Term of patent 14 years
U.S. Cl. D14—17

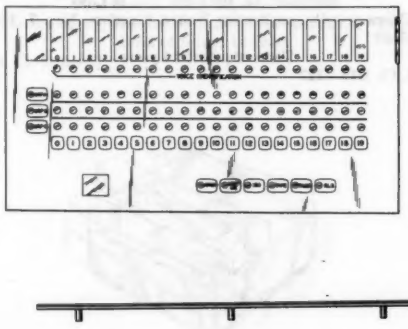
277,179
PORTABLE RADIO TELEPHONE OR THE LIKE
Guenter Specht, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Jun. 17, 1982, Ser. No. 389,262
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, MR.BD9NR.12782
Term of patent 14 years
U.S. Cl. D14—53



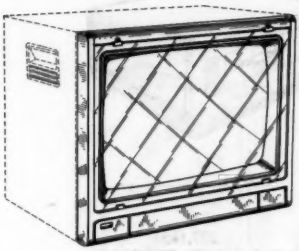
277,180
TELEPHONE
Bernard A. Paul, 788 Greenview Ave., Des Plaines, Ill. 60016
Filed Jun. 1, 1982, Ser. No. 383,910
Term of patent 14 years
U.S. Cl. D14—53



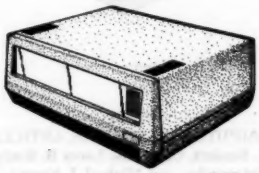
277,181
TELECONFERENCING TELEPHONE SET CONTROL PANEL
Henry J. Heim, College Point, N.Y., and Alfred R. Ender, Lawrenceville, N.J., assignors to AT&T Technologies, Inc., New York, N.Y.
Filed Mar. 31, 1982, Ser. No. 364,368
Term of patent 14 years
U.S. Cl. D14—60



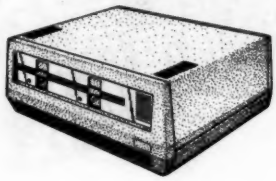
277,182
VIDEO MONITOR FRONT PANEL ASSEMBLY
Hari Matsuda, Evanston; Anthony J. Cascarano, Lake Forest, and Charles M. Schwimmer, Chicago, all of Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.
Filed Jun. 2, 1982, Ser. No. 384,398
Term of patent 14 years
U.S. Cl. D14—84



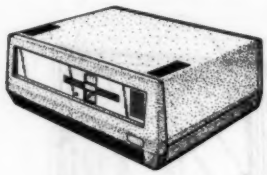
277,183
COMPUTER CONSOLE
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 429,771
Term of patent 14 years
U.S. Cl. D14—100



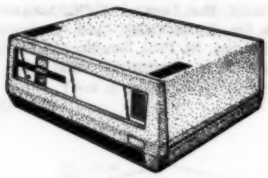
277,184
COMPUTER CONSOLE
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 429,773
Term of patent 14 years
U.S. Cl. D14—100



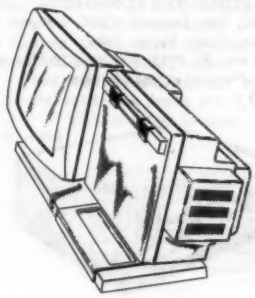
277,185
COMPUTER CONSOLE
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 432,058
Term of patent 14 years
U.S. Cl. D14—100



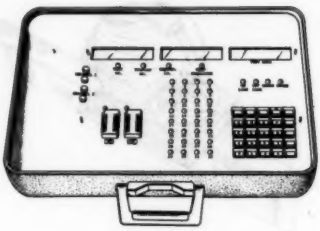
277,186
COMPUTER CONSOLE
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 432,059
Term of patent 14 years
U.S. Cl. D14—100



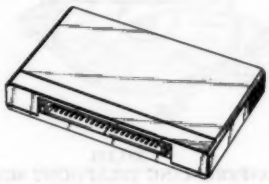
277,187
COMPUTER OR SIMILAR ARTICLE
Matthew H. L. Sanders, Cupertino; Leroy B. Keely, Sunnyvale; William G. Moggridge, and Michael J. Nuttall, both of Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.
Filed Oct. 20, 1980, Ser. No. 198,969
Term of patent 14 years
U.S. Cl. D14—106



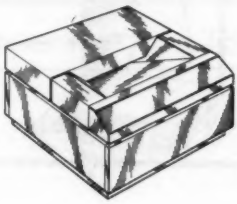
277,188
PORTABLE PROGRAMMING AND TESTING TOOL
John C. Doane, Glastonbury, and William J. Aikey, Simsbury, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.
Filed Feb. 25, 1982, Ser. No. 352,481
Term of patent 14 years
U.S. Cl. D14—107



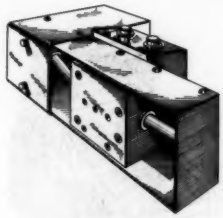
277,189
MEMORY UNIT CARTRIDGE FOR ELECTRONIC COMPUTERS
Mikio Shibata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Mar. 15, 1982, Ser. No. 357,860
Claims priority, application Japan, Sep. 19, 1981, 56/41252
Term of patent 14 years
U.S. Cl. D14—114



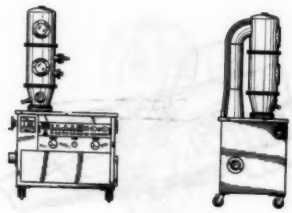
277,190
DOCUMENT SHREDDER
Kenneth G. Sadler, Horsham, England, assignor to Ofrex Group Limited, London, England
Filed Apr. 12, 1982, Ser. No. 367,590
Claims priority, application United Kingdom, Nov. 7, 1981, 1003489
Term of patent 14 years
U.S. Cl. D15—127



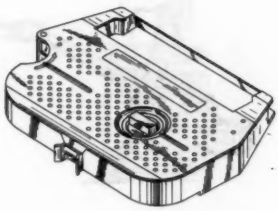
277,191
CARRIAGE MOUNTED TOOL OSCILLATOR
Ralph Farmer, Junction City, and David E. Johnson, Pataskala, both of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Jan. 25, 1982, Ser. No. 342,037
Term of patent 14 years
U.S. Cl. D15—138



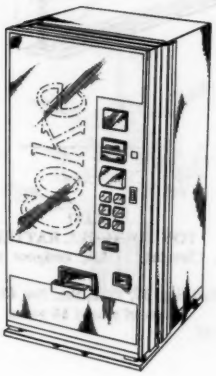
277,192
COMBINED GRANULATOR, DRYER AND COATER
Reinhard Nowak, Binzen, Fed. Rep. of Germany, assignor to Glatt GmbH, Binzen Kr. Lörrach, Fed. Rep. of Germany
Filed Mar. 16, 1982, Ser. No. 358,624
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, MR IV/2474
Term of patent 14 years
U.S. Cl. D15—144



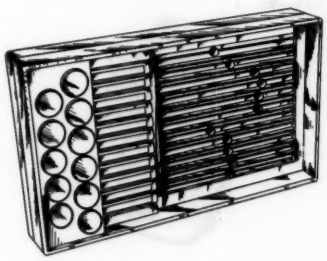
277,193
RIBBON CARTRIDGE FOR TYPEWRITER
Tetsuma Asahi, Kodaira, Japan, assignor to Silver Seiko Limited, Japan
Filed Dec. 9, 1982, Ser. No. 448,194
Claims priority, application Japan, Jun. 30, 1982, 57-29501
Term of patent 14 years
U.S. Cl. D18—12



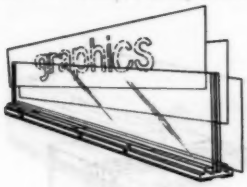
277,194
VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 236,182, Feb. 20, 1981, Pat. No. Des. 266,377. This application Dec. 4, 1981, Ser. No. 327,458
Term of patent 14 years
U.S. Cl. D20—5



277,195
TWO SIDED IN-OUT PANEL AND MESSAGE HOLDER
Arthur A. Lahmer, 8036 Modesto Dr., Delta, British Columbia, Canada (V4C 4B1)
Filed Sep. 23, 1982, Ser. No. 422,204
Term of patent 14 years
U.S. Cl. D20—18



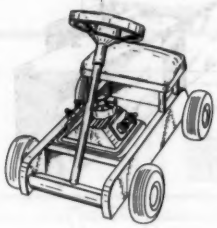
277,196
SIGN SUPPORT BRACKET
Gordon W. Eason, 1326 Larkmoor, Berkley, Mich. 48072
Filed Oct. 7, 1982, Ser. No. 433,313
Term of patent 14 years
U.S. Cl. D20—43



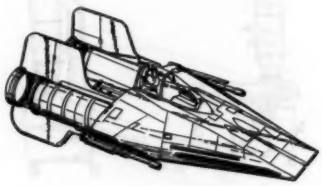
277,197
TOY SQUIRREL RATTLE
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,664
Term of patent 14 years
U.S. Cl. D21—65

277,198
TOY KITTEN RATTLE
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,665
Term of patent 14 years
U.S. Cl. D21—65

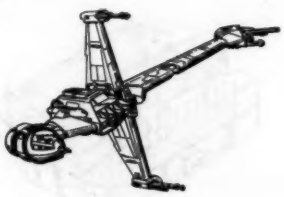
277,199
RIDING TOY
Douglas R. Miller, Hamburg, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 27, 1983, Ser. No. 461,607
Term of patent 14 years
U.S. Cl. D21—78



277,200
TOY SPACECRAFT
Joseph E. Johnston, San Rafael, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Nov. 12, 1982, Ser. No. 440,922
Term of patent 14 years
U.S. Cl. D21—87



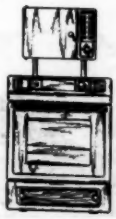
277,201
TOY SPACECRAFT
Joseph E. Johnston, San Rafael, and William T. George, Kentfield, both of Calif., assignors to Lucasfilm, Ltd., San Rafael, Calif.
Filed Nov. 12, 1982, Ser. No. 440,923
Term of patent 14 years
U.S. Cl. D21—87



277,202
TOY DOLLHOUSE
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Sep. 30, 1982, Ser. No. 431,745
Term of patent 14 years
U.S. Cl. D21—114

277,203
TOY PLIERS
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,670
Term of patent 14 years
U.S. Cl. D21—120

277,204
TOY STOVE OR SIMILAR ARTICLE
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Jun. 11, 1982, Ser. No. 387,284
Term of patent 14 years
U.S. Cl. D21—122



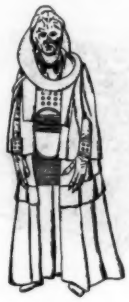
277,205
TOY TRACKWAY
Toshio Suzuki, and Takashi Maezono, both of Tokyo, Japan, assignors to Toybox Corporation, Tokyo, Japan
Filed Aug. 23, 1982, Ser. No. 410,639
Claims priority, application Japan, Feb. 26, 1982, 57-7656
Term of patent 14 years
U.S. Cl. D21—143

277,206
TOY FIGURE
David L. Carson, Lagunitas, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 27, 1982, Ser. No. 423,990
Term of patent 14 years
U.S. Cl. D21—148

277,207
TOY FIGURE
Nilo D. Rodis-Jamero, San Rafael, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 27, 1982, Ser. No. 424,135
Term of patent 14 years
U.S. Cl. D21—148

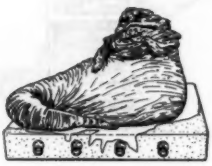
277,208
TOY FIGURE
Philip A. Tippett, Oakland, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 28, 1982, Ser. No. 426,036
Term of patent 14 years
U.S. Cl. D21—148

277,209
TOY FIGURE
Philip A. Tippett, Oakland, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 28, 1982, Ser. No. 426,038
Term of patent 14 years
U.S. Cl. D21—148



277,210
TOY FIGURE
Kenneth R. Ralston, Petaluma, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 28, 1982, Ser. No. 426,039
Term of patent 14 years
U.S. Cl. D21—148

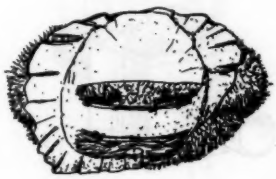
277,211
TOY FIGURE
Philip A. Tippett, Oakland, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 432,032
Term of patent 14 years
U.S. Cl. D21—148



277,212
TOY FIGURE
Anthony J. McVey, Mill Valley, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 432,060
Term of patent 14 years
U.S. Cl. D21—148

277,213
TOY FIGURE
Philip A. Tippett, Oakland, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 432,159
Term of patent 14 years
U.S. Cl. D21.148

277,214
TOY FIGURE
Joseph E. Johnston, San Rafael, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 432,162
Term of patent 14 years
U.S. Cl. D21—148

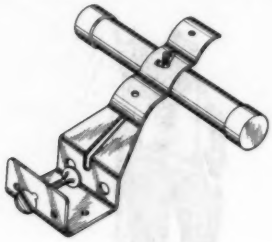


277,215
TOY FIGURE
Joseph E. Johnston, San Rafael, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 432,163
Term of patent 14 years
U.S. Cl. D21—148

277,216
TOY CARROT
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,144
Term of patent 14 years
U.S. Cl. D21—155

277,217
DOLL
Yoshiharu Ogawa, Tokyo, Japan, assignor to Kabushiki Kaisha Washino Design and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan
Filed Sep. 23, 1982, Ser. No. 422,207
Term of patent 14 years
U.S. Cl. D21—174

277,218
EXERCISE FOR ATTACHMENT TO DOOR OR THE LIKE
Robert S. Hinds, 1803 Regent St., Madison, Wis. 53705
Filed Aug. 12, 1981, Ser. No. 292,205
Term of patent 14 years
U.S. Cl. D21—191

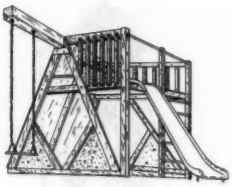


277,219
ABDOMINAL EXERCISE BENCH
Martin W. Johnson, R.R. #1, Box 95, Portland, N. Dak. 58274
Filed Sep. 29, 1982, Ser. No. 430,735
Term of patent 14 years
U.S. Cl. D21—191

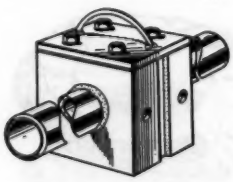
277,220
WALK SIMULATING EXERCISE CUSHION
Neil J. Herburger, 980 Victoria Pl., Dubuque, Iowa 52001
Filed Jun. 14, 1982, Ser. No. 388,075
Term of patent 14 years
U.S. Cl. D21—192

277,221
GOLF CLUB HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 6, 1982, Ser. No. 365,920
Claims priority, application Japan, Nov. 11, 1981, 56-50192
Term of patent 14 years
U.S. Cl. D21—214

277,222
PLAY CENTER
Barry D. Mower, 3790 Riverdale Rd., and Brent R. Allen, 5125 S. 1250, both of West Ogden, Utah 84403
Filed Jul. 26, 1982, Ser. No. 401,658
Term of patent 14 years
U.S. Cl. D21—244

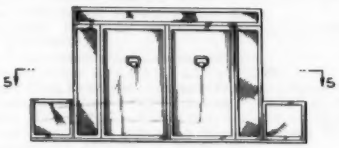


277,223
GAS PRESSURE DIFFERENTIAL-MEASURING SYSTEM ORIFICE FITTING
Adam F. Gall, and Howard P. McJunkin, Jr., both of Charleston, W. Va., assignors to McJunkin Corporation, Charleston, W. Va.
Filed Oct. 25, 1982, Ser. No. 436,459
Term of patent 14 years
U.S. Cl. D23—1

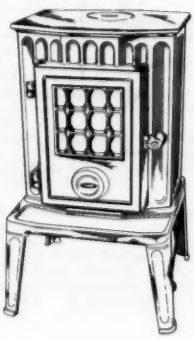


277,224
CHARCOAL STARTER
Frank C. Cole; Marvin G. Kern, both of St. Louis, and Robert Meiner, Creve Coeur, all of Mo., assignors to Crunden Martin Mfg., Co., St. Louis, Mo.
Filed Dec. 31, 1981, Ser. No. 336,181
Term of patent 14 years
U.S. Cl. D23—90.1

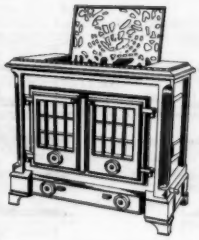
277,225
FIREPLACE CROSS-CIRCULATING AIR HEATER
Bunyan B. Cagle, 1700 Towson Ave., Fort Smith, Ark. 72901
Filed Sep. 13, 1982, Ser. No. 417,500
Term of patent 14 years
U.S. Cl. D23—95



277,226
STOVE
Henry T. Creffield, Shrewsbury, England, assignor to Glynwed Limited, Sheldon, England
Filed Feb. 27, 1981, Ser. No. 239,083
Term of patent 14 years
U.S. Cl. D23—97

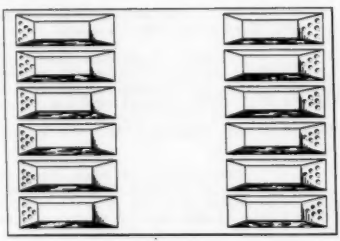


277,227
STOVE
Vance Smith, Randolph, Vt., assignor to Glynwed Limited, Sheldon, England
Filed Feb. 27, 1981, Ser. No. 239,085
Term of patent 14 years
U.S. Cl. D23—97

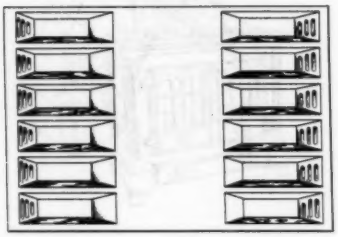


277,228
HEATER ENCLOSURE
Thomas C. Blesch, Okemos, Mich., assignor to General Aluminum Products, Inc., Charlotte, Mich.
Filed Nov. 8, 1982, Ser. No. 439,887
Term of patent 14 years
U.S. Cl. D23—138.2

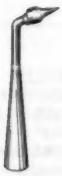
277,229
ROOF RIDGE VENTILATOR
Jerry R. Williamson, and Keith A. Muters, both of P.O. Box 159, Woodburn, Oreg. 97071
Filed Sep. 13, 1982, Ser. No. 417,446
Term of patent 14 years
U.S. Cl. D23—153



277,230
ROOF RIDGE VENTILATOR
Jerry R. Williamson, and Keith A. Muters, both of P.O. Box 159, Woodburn, Oreg. 97071
Filed Sep. 13, 1982, Ser. No. 417,447
Term of patent 14 years
U.S. Cl. D23—153



277,231
PERIODONTIC STIMULATOR
Gerald Rosenbaum, Paramus, N.J., assignor to Perio Products, Inc., Fort Lee, N.J.
Filed Sep. 27, 1982, Ser. No. 424,882
Term of patent 14 years
U.S. Cl. D24—10



277,232
(1) CONNECTING ELEMENT FOR COUPLING A DENTIST'S DRILL AND HOSES WITH COOLING WATER AND COMPRESSED AIR AS WELL AS (2) AND (3) ACCESSORIES THEREFOR
Peter L. Rasch, Riskaer 2, 2760 Målov, Denmark
Filed Nov. 24, 1981, Ser. No. 324,638
Claims priority, application Denmark, May 29, 1981, 600/81
Term of patent 14 years
U.S. Cl. D24—16

277,233
FACE DEPILATING APPARATUS
Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France
Filed Mar. 23, 1982, Ser. No. 361,075
Claims priority, application France, Oct. 2, 1981, 813389
Term of patent 14 years
U.S. Cl. D24—26

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Arthur Limited: *See—*
Arthur, Eric R., 4,493,445, Cl. 223-68.000.

AB Volvo: *See—*
Fortgens, Walter, 4,493,478, Cl. 254-126.000.

Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A. Method of manufacturing a flexible pipe. 4,493,140, Cl. 29-446.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. System for regulating the idle speed of an internal combustion engine. 4,493,301, Cl. 123-339.000.

Abe, Masaru, to Alps Electric Co., Ltd. Brush-mounting structure of miniature motor. 4,494,026, Cl. 310-89.000.

Abe, Yoshiaki, to Kao Soap Co., Ltd. Hair rinse composition. 4,493,824, Cl. 424-70.000.

Abel, Earl E. Security lock for sliding doors or windows. 4,493,501, Cl. 292-263.000.

Abys, Joseph A.; and Okinaka, Yutaka, to AT&T Bell Laboratories. Electrodes for palladium electroplating process. 4,493,754, Cl. 204-47.000.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Storage device for flat recording media. 4,493,417, Cl. 206-387.000.

Adamczyk, Thomas J.: *See—*
Valenti, Edward R.; Adamczyk, Thomas J.; and Graham, Larry W., 4,493,482, Cl. 270-12.000.

Adams, William R., to Trindium Corporation of America. Tarnish-resistant copper alloy and method of preparation. 4,493,736, Cl. 148-2.000.

Adler, Michael S.: *See—*
Wildi, Eric J.; and Adler, Michael S., 4,494,134, Cl. 357-43.000.

Adolfsson, Morgan; Brogardh, Torgny; Ovren, Christer; and Persson, Anders, to Asea Aktiebolag. Fiber optical measuring device with a frequency sensitive transducer. 4,493, 195, Cl. 250-227.000.

Advanced Mechanical Technology, Inc.: *See—*
Carignan, Forest J.; and Cook, Nathan H., 4,493,220, Cl. 73-862.660.

Aetna Telecommunications Laboratories: *See—*
Nelson, Arthur R., 4,493,212, Cl. 73-517.00R.

Affupper, Hans. Process and equipment for making zigzag folds in loops of a continuous feed of flexible sheeting. 4,493,689, Cl. 493-415.000.

Agapiou, Michael. Toilet cleaning tool. 4,493,124, Cl. 15-104.940.

Agarwal, Suresh C., to Babcock & Wilcox Company, The. Blending control system. 4,494,209, Cl. 364-502.000.

AGFA-Gevaert Aktiengesellschaft: *See—*
Bauer, Walter; Farber, Heinrich; and Muller, Jurgen, 4,493,545, Cl. 354-277.000.

Agostine, Doretta: *See—*
Gruber, Robert J.; Agostine, Doretta; Julien, Paul C.; and Yourd, Raymond A., III, 4,493,883, Cl. 430-110.000.

Agro-Technics International Ltd.: *See—*
de Monbrison, Christian, 4,493,163, Cl. 47-61.000.

Ai, Minoru; Manabe, Akira; Igarashi, Yoshimasa; and Mizuno, Katsuya, to Sankin Kogyo Kabushiki Kaisha. Device for measuring and scraping operations in the field of prestorative dentistry. 4,493,644, Cl. 433-75.000.

Aihara, Hironaka: *See—*
Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, 4,493,847, Cl. 424-317.000.

Aisan Industry Co., Ltd.: *See—*
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,493,804, Cl. 261-44.00C.

Aisen Kogyo, Ltd.: *See—*
Iwahashi, Shoji, 4,493,315, Cl. 128-60.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Haneda, Hideo; and Yamanaka, Minoru, 4,494,098, Cl. 335-230.000.
Nagata, Kazuhisa; Mori, Keiji; and Ogasawara, Asao, 4,493,507, Cl. 296-216.000.
Ohyama, Tadashi, 4,493,474, Cl. 251-129.000.

Akiyama, Toru, to Universal Pioneer Corporation. Pickup control device and method for fast or slow reproduction in a disk reading system. 4,494,154, Cl. 358-342.000.

Akzo nv: *See—*
Vrouenraets, Cornelius M. F.; and Sikkema, Doetze J., 4,493,870, Cl. 428-245.000.

Albien, Wolfgang: *See—*
Knigge, Rolf; and Albien, Wolfgang, 4,493,857, Cl. 427-96.000.

Albright, John P.; Martin, Robert K.; and Dyson, John A., to University of Iowa Research Foundation. Suturing device and method for using same. 4,493,323, Cl. 128-340.000.

Alco Industries, Inc.: *See—*
Schmidt, Donald J., 4,493,201, Cl. 72-349.000.

Alcon Laboratories, Inc.: *See—*
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,493,783, Cl. 252-174.230.

Alden Press, Inc.: *See—*
Valenti, Edward R.; Adamczyk, Thomas J.; and Graham, Larry W., 4,493,482, Cl. 270-12.000.

Alexander, Michael P., to American Sunroof Corporation. Vehicle rocker panel structure. 4,493,506, Cl. 296-209.000.

Aliev, Gabil G.: *See—*
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,493,140, Cl. 29-446.000.

Alimbau, Salvador M. Convertible fold-up ladder. 4,493,392, Cl. 182-27.000.

Allbert, Helen M.: *See—*
Allbert, James C.; and Allbert, Helen M., 4,493,862, Cl. 428-10.000.

Allbert, James C.; and Allbert, Helen M. Ornamental assembly and method. 4,493,862, Cl. 428-10.000.

Allen, Henry C.: *See—*
Ducote, Marjorie E.; and Allen, Henry C., 4,493,741, Cl. 149-19.400.

Allentyne Limited: *See—*
Uldall, Peter R., 4,493,696, Cl. 604-43.000.

Allesch, Roland: *See—*
Ley, Antony; Allesch, Roland; and Bazin, Alain, 4,494,068, Cl. 324-126.000.

Allied Corporation: *See—*
Davies, Jeffrey N., 4,493,520, Cl. 339-91.00P.

Alps Electric Co., Ltd.: *See—*
Abe, Masaru, 4,494,026, Cl. 310-89.000.
Noji, Tasuku; and Hiyama, Torao, 4,494,095, Cl. 334-85.000.
Tada, Ikuo, 4,493,567, Cl. 400-124.000.

Altekruse, Richard A., to General Electric Company. Dual purpose array processor for a CT scanner. 4,494,141, Cl. 358-111.000.

ALZA Corporation: *See—*
Urquhart, John; and Theeuwes, Felix, 4,493,702, Cl. 604-80.000.

Amax Inc.: *See—*
Wicker, Gordon R., 4,493,157, Cl. 34-10.000.

Ambic Equipment Limited: *See—*
Marshall, Barry R.; and Knight, Paul A., 4,493,619, Cl. 417-307.000.

Ambrosi, Dominique: *See—*
de Reinach Hirtzbach, Francois; and Ambrosi, Dominique, 4,493,729, Cl. 71-94.000.

Amchem Products, Inc.: *See—*
Williamson, Stanley C., 4,493,782, Cl. 252-95.000.

Amcor Ltd.: *See—*
Wachsman, Mordechai, 4,493,247, Cl. 98-1.000.

American Hoechst Corporation: *See—*
Funderburk, F. Gene; Culbertson, E. C.; and Posey, Robert G., 4,493,872, Cl. 428-332.000.

American Hospital Supply Corporation: *See—*
Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., 4,493,701, Cl. 604-73.000.
Borsanyi, Alexander S.; and Bobo, Donald E., 4,493,706, Cl. 604-153.000.

American Motors (Canada) Inc.: *See—*
Bostater, Joseph A.; MacGregor, Angus J.; and Gesicki, Aaron A., 4,493,359, Cl. 164-58.100.

American Petro Mart, Inc.: *See—*
Hedrick, Harold N.; and Whitney, Solon G., 4,493,907, Cl. 521-26.000.

American Roller Company: *See—*
Hyllberg, Bruce E.; and Brands, George B., 4,493,256, Cl. 101-216.000.

American Sunroof Corporation: *See—*
Alexander, Michael P., 4,493,506, Cl. 296-209.000.

AMP Incorporated: *See—*
Asick, John C., 4,493,518, Cl. 339-45.00M.
Bakermans, Johannes C. W., 4,493,147, Cl. 29-861.000.
Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., 4,493,525, Cl. 339-143.00R.
Kaleida, Richard H., 4,493,952, Cl. 200-5.00A.
Kimmel, David J.; and Lauterbach, John H., 4,493,954, Cl. 200-11.00R.

Ampex Corporation: *See—*
Noel, Stan L., 4,494,164, Cl. 361-101.000.
Ravizza, Raymond F., 4,494,153, Cl. 358-324.000.

Ampferer, Herbert, to Dr. Ing. h.c.F. Porsche A.G. Internal combustion engine, especially for motor vehicles. 4,493,295, Cl. 123-41.860.

Anders, Peter; and Schierling, Bernhard, to Fichtel & Sachs AG. Torsional vibration damper unit. 4,493,673, Cl. 464-66.000.

Anderson, John W., Jr.: *See—*
Roche, William J.; and Anderson, John W., Jr., 4,494,041, Cl. 315-49.000.

Anderson, Richard G.: *See—*
Haldipur, Gaurang B.; Anderson, Richard G.; and Cherish, Peter, 4,493,636, Cl. 431-170.000.

Anderson, Richard N., to Hunter Douglas Inc. Suspension system for suspending a venetian blind assembly. 4,493,357, Cl. 160-174.000.

Ando, Makoto; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Focus adjusting device for camera having varifocal optical system. 4,493,534, Cl. 350-429.000.

Andrione, Norbert; Peruzzi, Federigo; and Scandurra, Giancarlo, to Aspera S.p.A. Crankshaft for small reciprocating machines. 4,493,226, Cl. 74-598.000.

Anorad Corporation: *See—*
Chitayat, Anwar; Goldstein, Robert C.; and Faizullabhoy, Mustansir A., 4,494,060, Cl. 318-568.000.

Aoki, Keiji: *See—*
Takimoto, Toshiyuki; and Aoki, Keiji, 4,493,305, Cl. 123-490.000.

Applied Power Inc.: *See—*
Sonneborn, Lambertus J., 4,493,386, Cl. 180-89.150.

Arad, Avi: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Avi, 4,493,671, Cl. 446-464.000.

Arai, Tetsuji; Mimura, Yoshiki; and Shimizu, Hiroshi, to Ushio Denki Kabushiki Kaisha. Method for heating semiconductor wafers by a light-radiant heating furnace. 4,493,977, Cl. 219-411.000.

Arakawa, Akio: *See—*
Suzuki, Hajime; Matsuyama, Shinichiro; and Arakawa, Akio, 4,494,203, Cl. 364-470.000.

Araki, Shigeyuki, to Ricoh Company, Ltd. Control system for impact printer. 4,493,570, Cl. 400-144.200.

Arbonite Corporation: *See—*
Thomson, Ian D. M., 4,493,864, Cl. 428-36.000.

Arcair Company: *See—*
Rieppel, Perry J.; and Coughlin, William J., 4,493,970, Cl. 219-137.410.

Arens, Robert A., to Artafax Systems Limited, Inc. Dismountable room partition. 4,493,174, Cl. 52-243.000.

Arlington Automatics, Inc.: *See—*
Magee, Robert L., Jr., 4,493,374, Cl. 166-382.000.

Armstrong, Donald E., to GTE Products Corporation. Multilamp photoflash array fabrication. 4,493,667, Cl. 445-28.000.

Arndt, Alfred; and Rutty, John G. Step-off device for aircraft voice communication system. 4,494,244, Cl. 455-78.000.

Arnold, Dan M.: *See—*
Smith, Harry D., Jr.; Arnold, Dan M.; and Schultz, Ward E., 4,493,998, Cl. 250-252.100.

Arnold, Don C.; and Wilcox, Thomas J., to Indiana Brass, Inc. Single lever faucet assembly. 4,493,343, Cl. 137-625.170.

Arnold, John E., Jr.: *See—*
King, Roger A.; and Arnold, John E., Jr., 4,493,710, Cl. 604-250.000.

Arnoldy, Roman. Mandrel machine. 4,493,963, Cl. 219-76.100.

Arnout, Michel: *See—*
Legrand, Pierre; and Arnout, Michel, 4,493,969, Cl. 219-130.400.

Artafax Systems Limited, Inc.: *See—*
Arens, Robert A., 4,493,174, Cl. 52-243.000.

Arthur, Eric R., to A. E. Arthur Limited. Bodyforms. 4,493,445, Cl. 223-68.000.

Artos Engineering Company: *See—*
Dusel, Robert O.; Berres, James J.; and Keene, Harold J., 4,493,233, Cl. 83-71.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Naito, Takeshi; Masamoto, Junzo; Iwaisako, Toshiyuki; and Matsuzaki, Kazuhiko, 4,493,752, Cl. 203-71.000.

Asano, Hiroyuki: *See—*
Dairiki, Osamu; Ookuma, Humio; and Asano, Hiroyuki, 4,494,205, Cl. 364-472.000.

Asea Aktiebolag: *See—*
Adolfsson, Morgan; Brogardh, Torgny; Ovren, Christer; and Persson, Anders, 4,493,995, Cl. 250-227.000.

Ashe, Bonnie M.: *See—*
Doherty, James B.; Zimmerman, Morris; and Ashe, Bonnie M., 4,493,839, Cl. 424-263.000.

Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, to May & Baker Limited. Indole and indoline carboxylic acid compounds and method of use. 4,493,843, Cl. 424-274.000.

Asick, John C., to AMP Incorporated. Extractor means multi-plane interconnection system. 4,493,518, Cl. 339-45.00M.

Asik, Joseph R., to Ford Motor Company. Enhanced spark energy distributorless ignition system (B). 4,493,306, Cl. 123-620.000.

Aspera S.p.A.: *See—*
Andrione, Norbert; Peruzzi, Federigo; and Scandurra, Giancarlo, 4,493,226, Cl. 74-598.000.

AT&T Bell Laboratories: *See—*
Abys, Joseph A.; and Okinaka, Yutaka, 4,493,754, Cl. 204-47.000.
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Sullivan, John M., 4,494,193, Cl. 364-200.000.
Brown, Earl F., 4,494,144, Cl. 358-133.000.
Dumbri, Austin C.; and Procyk, Frank J., 4,494,220, Cl. 365-200.000.
Ehrenbard, Christine H.; and Gottfried, Noah L., 4,494,242, Cl. 375-118.000.
Hwang, James C., 4,493,142, Cl. 29-575.000.
Martin, Gary D., 4,494,239, Cl. 375-39.000.
Turner, Jonathan S., 4,494,230, Cl. 370-60.000.

AT&T Technologies, Inc.: *See—*
Kanotz, William M.; Vesperman, William C.; and Wilson, Max K., 4,493,747, Cl. 156-64.000.
Morse, William C.; and Phaneuf, John B., 4,494,033, Cl. 310-352.000.

Ateya, Antoun I., to Eastman Kodak Company. Apparatus for supporting flexible members. 4,493,548, Cl. 355-3.0FU.

Atlantic Richfield Company: *See—*
Le-Khac, Bi, 4,493,920, Cl. 525-67.000.
Mamantov, Gleb; and Mamantov, Charmaine B., 4,493,784, Cl. 252-182.000.

Attema, Gijsbertus. Electrical ducting system. 4,493,516, Cl. 339-21.00R.

Attridge, David M.: *See—*
Teumer, Roger G.; and Attridge, David M., 4,493,483, Cl. 271-186.000.

Audi, Joseph: *See—*
Schwarzenberg, Norbert; Ueberwolf, Heinz; Halberschmidt, Friedrich; and Audi, Joseph, 4,493,724, Cl. 65-273.000.

Augustine, Paul C., Jr., to General American Transportation Corporation. Railway hopper car and center sill construction therefor. 4,493,266, Cl. 105-255.000.

Automotive Engine Associates: *See—*
Showalter, Merle R., 4,493,292, Cl. 123-41.200.

Auwerda, Cornelis P.; and Koel, Gerrit J., to U.S. Philips Corporation. Method of manufacturing optical fibres. 4,493,721, Cl. 65-3.120.

Avedesian, Michael M. Apparatus and method involving supercritical fluid extraction. 4,493,797, Cl. 530-507.000.

Avery International Corp.: *See—*
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.

Axelrod, Randolph H.: *See—*
Piascinski, Joseph J.; Axelrod, Randolph H.; and Mount, James, 4,493,668, Cl. 445-40.000.

Axer, Heinrich, to Joseph Vogele AG. Bituminous finisher. 4,493,585, Cl. 404-102.000.

Axia Incorporated: *See—*
Reed, Larry T., 4,493,746, Cl. 156-644.000.

Ayers, Ray R.; and Hemphill, Dean P., to Shell Oil Company. Method and apparatus for on surface joining of submarine pipeline segments using an eccentric hinge. 4,493,590, Cl. 405-170.000.

Babcock & Wilcox Company, The: *See—*
Agarwal, Suresh C., 4,494,209, Cl. 364-502.000.
Thompson, William L., 4,494,213, Cl. 364-604.000.

Bachmann Industries, Inc.: *See—*
Bachmann, Lothar, 4,493,311, Cl. 126-285.00A.
Bachmann, Lothar, 4,493,342, Cl. 137-601.000.

Bachmann, Lothar, to Bachmann Industries, Inc. Guillotine damper. 4,493,311, Cl. 126-285.00A.

Bachmann, Lothar, to Bachmann Industries, Inc. Double louver damper. 4,493,342, Cl. 137-601.000.

Bader, Leonhard; Hermann, Ferdinand; Ruprich, Wilhelm; and Winter, Hermann, to NCR Corporation. Method of making a drive element assembly for ink jet printing. 4,493,137, Cl. 29-25.350.

Badillo, Paul, to Bakron Corp. Rotary loop taker for lock-stitch sewing machine. 4,493,278, Cl. 112-184.000.

Bagcraft Corporation of America: *See—*
Blamer, Robert H., 4,493,685, Cl. 493-235.000.

Bagnall-Wild, Ralph H.: *See—*
Smith, Gordon R.; Stewart, John H.; and Bagnall-Wild, Ralph H., 4,494,198, Cl. 364-423.000.

Bahr, Richard G.; and Cohen, Paul B., to Prime Computer, Inc. Method and apparatus for the detection and regeneration of a lost token in a token based data communications network. 4,494,233, Cl. 370-86.000.

Bailey, David A., to Garrett Corporation, The. Multi-quadrant brushless DC motor drive. 4,494,051, Cl. 318-254.000.

Bailey, Ralph J. Multiposition valved dispenser. 4,493,443, Cl. 222-400.800.

Bailleux, Christian; Bernard, Michel; Dupont, Bernard; Lozach, Guy; and Mata, Jean-Pierre, to Electricite de France. Blend of polymers, its preparation and its application to the manufacture of components of electrochemical reactors. 4,493,917, Cl. 524-394.000.

Baird, David M. Seal for quick disconnect coupling. 4,493,475, Cl. 251-149.100.

Baker Oil Tools, Inc.: *See—*
Jackson, Gerald D., 4,493,373, Cl. 166-321.000.

Bakermans, Johannes C. W., to AMP Incorporated. Apparatus for fabrication of a crossover wire harness. 4,493,147, Cl. 29-861.000.

Bakker, Jan, to U.S. Philips Corporation. Magnetic head and method of manufacturing a magnetic head. 4,494,160, Cl. 360-129.000.

Bakron Corp.: *See—*
Badillo, Paul, 4,493,278, Cl. 112-184.000.

Balabanova, Tzvetanka. Foldable multi-functional carriage. 4,493,492, Cl. 280-651.000.

Balzano, Quirino: *See—*
Garay, Oscar M.; and Balzano, Quirino, 4,494,122, Cl. 343-722.000.

Banker, John G., to United States of America, Energy. Method for fabricating uranium alloy articles without shape memory effects. 4,493,737, Cl. 148-11.50R.

Banks, Charles A., to SL Industries, Inc. Multiple electrical outlet strip construction. 4,493,515, Cl. 339-14.00L.

Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich, 4,493,628, Cl. 425-192.000.

Barnes, Christopher S.; Moore, Paul A.; and White, Philip D., to U.S. Philips Corporation. High power acoustic wave arrangement with N^2 parallel-series connected acoustic wave devices. 4,494,031, Cl. 310-313.00B.

Barr & Stroud Limited: *See*—
Smith, Gordon R.; Stewart, John H.; and Bagnall-Wild, Ralph H., 4,494,198, Cl. 364-423.000.

Barszczewski, Andrzej, to Canadian Patents & Development Limited. Fast frequency measuring system. 4,494,067, Cl. 324-79.00D.

Bartnik, Friedhelm: *See*—
Moller, Hinrich; Wallat, Siegfried; Bartnik, Friedhelm; and Pittermann, Wolfgang, 4,493,823, Cl. 424-70.000.

Bartosevich, Joseph F.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,493,930, Cl. 544-360.000.

BASF Aktiengesellschaft: *See*—
Echte, Adolf; and Gausepohl, Hermann, 4,493,922, Cl. 525-71.000.
Jaedicke, Hagen; and Tonne, Peter, 4,493,802, Cl. 260-507.00R.
Merger, Franz; and Nestler, Gerhard, 4,493,801, Cl. 260-465.600.
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.
Wintermantel, Klaus; Stockburger, Dieter; and Fuchs, Hugo, 4,493,719, Cl. 62-532.000.

BASF Wyandotte Corporation: *See*—
Schwartz, Ellen S.; and Tincher, Cline A., 4,493,780, Cl. 252-73.000.

Bass, Alva W., to United States of America, Army. Eccentrically tightened latch device. 4,493,581, Cl. 403-323.000.

Batra, Subhash C.: *See*—
Kadison, Eric M.; Batra, Subhash C.; and Meir, Gad E., 4,494,156, Cl. 360-48.000.

Batterman, Eric P.: *See*—
Bernard, Francis S.; Eliscu, Steven M.; and Batterman, Eric P., 4,494,214, Cl. 364-724.000.

Bauer, Walter; Farber, Heinrich; and Muller, Jurgen, to AGFA-Gevaert Aktiengesellschaft. Film cassette. 4,493,545, Cl. 354-277.000.

Baumann, Ludwig G. Device for the treatment of the eyes with a washing or bathing liquid. 4,493,119, Cl. 4-620.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bilstad, Arnold C.; Foley, John T.; and Woodworth, Walker P., 4,493,693, Cl. 604-6.000.

Bayer Aktiengesellschaft: *See*—
Haas, Peter; and Hettel, Hans, 4,493,909, Cl. 521-166.000.
Ippen, Jakob; and Stuttgen, Friedel, 4,493,355, Cl. 152-329.000.
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,493,861, Cl. 427-304.000.

Bayer, Stephen J.; and Olsen, Arthur M., to Honeywell Inc. Process variable transmitter having a non-interacting operating range adjustment. 4,494,183. Cl. 364-154.000.

Bazin, Alain: *See*—
Ley, Antony; Allesch, Roland; and Bazin, Alain, 4,494,068, Cl. 324-126.000.

Beam, Dennis A.: *See*—
Sarazen, Paul M., Jr.; and Beam, Dennis A., 4,493,456, Cl. 236-49.000.

Bean, George H.; and Gum, Peter H., to International Business Machines Corporation. Method and means for switching system control of CPUs. 4,494,189, Cl. 364-200.000.

Beard, Charles L., Jr.; and Camden, Thomas M., to Westinghouse Electric Corp. High uranium utilization fuel rod for light water reactors. 4,493,814, Cl. 376-428.000.

Beard, Robert W.; and Kirk, Russell F., to OXIMETRIX, Inc. Portable fluid infusion apparatus. 4,493,704, Cl. 604-154.000.

Beaujean, Holger; Kamphausen, Willi; Niephaus, Dieter; and Nommensen, Ove, to Kernforschungsanlage Julich GmbH. Valve system for pressurized vessels. 4,493,434, Cl. 222-3.000.

Becht, Carl T., to Senco Products, Inc. Surgical stapling instrument. 4,493,322, Cl. 128-334.00R.

Beck, Warren R.; and Castle, Richard B., to Minnesota Mining and Manufacturing Company. Proppant for well fractures and method of making same. 4,493,875, Cl. 428-403.000.

Becker, Donald E.; Hayes, Alan C.; and Porter, Joseph W. Insulation system for process vessel. 4,493,816, Cl. 422-143.000.

Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, to Kernforschungszentrum Karlsruhe GmbH. Method for producing separating nozzle elements for the separation of fluid mixtures. 4,493,753, Cl. 204-9.000.

Becker, Willi; and Johannsen, Karl, to Willi Becker Ingenieurburo GmbH. Ship having at least one propeller nozzle unit with rudder in optimum position. 4,493,660, Cl. 440-67.000.

Beckmann, Paul J.: *See*—
Hartlaub, Jerome T.; and Beckmann, Paul J., 4,493,325, Cl. 128-419.0PG.

Beffa, Fabio, to Ciba Geigy Corporation. Metal complexes of disazo dyes. 4,493,798, Cl. 534-697.000.

Behrmann, Edgar A.: *See*—
Wisthuff, Scott D.; and Behrmann, Edgar A., 4,493,675, Cl. 464-136.000.

Beier, Rudolf: *See*—
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,493,388, Cl. 180-258.000.

Beikel, Alfons G.; and Jarosch, Harald, to Westfalia Separator AG. Device for removing air from hermetic, automatically emptying centrifuge drums. 4,493,350, Cl. 141-65.000.

Belko, Robert P.: *See*—
Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., 4,493,790, Cl. 252-522.00R.

Bell, Alan G.; Lyon, Richard F.; and Borriello, Gaetano, to Xerox Corporation. Self-calibrated clock and timing signal generator for MOS/VLSI circuitry. 4,494,021, Cl. 307-591.000.

Bendix Corporation, The: *See*—
Esken, Robert L., 4,493,153, Cl. 33-149.00J.
Piscitelli, R. Amelia; Hemmer, Valentine J.; and Shepler, Eric F., 4,493,527, Cl. 339-258.00R.
Putt, James B., 4,493,742, Cl. 156-91.000.
Trinh, Lanh T.; and Loy, Robert W., 4,493,307, Cl. 123-630.000.
Wisthuff, Scott D.; and Behrmann, Edgar A., 4,493,675, Cl. 464-136.000.

Benefiel, Earl H.: *See*—
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,493,421, Cl. 211-13.000.

Bennett, Jeffrey H., to Northern Telecom Limited. Switched-capacitor variable equalizer. 4,494,082, Cl. 333-28.00R.

Benoit, Gordon L.: *See*—
Prader, Randolph D.; Benoit, Gordon L.; and Maddock, Robert T., 4,493,419, Cl. 206-554.000.

Benson, Harvey S., to Southwest Research Institute. Electric capacity measurement of erratically shorted capacitors. 4,494,065, Cl. 324-61.00R.

Bentley Laboratories, Inc.: *See*—
Gordon, Lucas S.; and Pierson, Jeanne, 4,493,705, Cl. 604-122.000.

Bergelson, Michael; Fridman, Jacob; and John, Erwin R., to Neurometrics, Inc. Automatic evoked potential detection. 4,493,327, Cl. 128-731.000.

Berger, L. Joseph, Jr.; and Guequierre, Denis D. In-line disposable filter. 4,493,717, Cl. 55-330.000.

Bergh, Ralph A.: *See*—
Shaw, Herbert J.; and Bergh, Ralph A., 4,493,528, Cl. 350-96.150.

Bergin, Thomas F., to TRW Inc. Pump assembly and operating method. 4,493,616, Cl. 417-53.000.

Bergman, Marc A.: *See*—
Chu, Raymond D.; and Bergman, Marc A., 4,493,614, Cl. 417-22.000.

Bernard, Francis S.; Eliscu, Steven M.; and Batterman, Eric P., to RCA Corporation. Apparatus for generating scaled weighting coefficients for sampled data filters. 4,494,214, Cl. 364-724.000.

Bernard, Jean R.; and Breysse, Michele, to Elf France. Regeneration process of an aromatization catalyst containing a Group VIII metal on a zeolite. 4,493,901, Cl. 502-37.000.

Bernard, Michel: *See*—
Bailleux, Christian; Bernard, Michel; Dupont, Bernard; Lozach, Guy; and Mata, Jean-Pierre, 4,493,917, Cl. 524-394.000.

Bernin, Victor M. Noncontacting keyboard employing a transformer element. 4,494,109, Cl. 340-365.00L.

Bernle, Gote L., to Tetra Pak International AB. Arrangement for the raising and transporting of packing container blanks. 4,493,687, Cl. 493-310.000.

Berres, James J.: *See*—
Dusel, Robert O.; Berres, James J.; and Keene, Harold J., 4,493,233, Cl. 83-71.000.

Berti, Eugenio, to Burroughs Corporation. Motor control for data disc rotating systems. 4,494,058, Cl. 318-372.000.

Bertrand, Gilles: *See*—
Reymond, Jean-Claude; Bertrand, Gilles; and Gabanou, Roland, 4,494,201, Cl. 364-449.000.

Beta Engineering & Development Ltd.: *See*—
Sadeh, Yaacov, 4,493,276, Cl. 112-121.120.

Betancourt, Walter J.: *See*—
Bohmer, William; Betancourt, Walter J.; and Hoffman, Louis S., 4,493,531, Cl. 350-330.000.

Betz, Hans: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, 4,493,753, Cl. 204-9.000.

Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., to Gulf Research & Development Company. Fluid bed catalyst for synthesis gas conversion and utilization thereof for preparation of diesel fuel. 4,493,905, Cl. 502-325.000.

Bhatia, Rajkumar P.: *See*—
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,493,783, Cl. 252-174.230.

Bianchi, Giuseppe, to Industrie Zanussi S.p.A. Electrolytic cell having nonporous partition. 4,493,760, Cl. 204-278.000.

Bianchi, Nereo, to Necchi S.p.A. Two-position needle plate for sewing machines. 4,493,280, Cl. 112-260.000.

Bielamowicz, Lawrence J.: *See*—
Reisberg, Joseph; Bielamowicz, Lawrence J.; and Thigpen, David R., 4,493,371, Cl. 166-274.000.

Bieringer, Hermann: *See*—
Horlein, Gerhard; Schonowsky, Hubert; Bieringer, Hermann; and Langeluddeke, Peter, 4,493,731, Cl. 71-118.000.

Billings, Philip A.; and Franks, William S., Jr., to Xerox Corporation. Printing machine with static elimination system. 4,494,166, Cl. 361-214.000.

Bilstad, Arnold C.; Foley, John T.; and Woodworth, Walker P., to Baxter Travenol Laboratories, Inc. Trans-membrane pressure monitoring system. 4,493,693, Cl. 604-6.000.

Binder, Kurt: *See*—
Gast, Theodor; Binder, Kurt; and Honig, Gunter, 4,493,215, Cl. 73-861.180.

Bio-Rad Laboratories, Inc.: *See*—
Fernwood, George G.; and Burd, Samuel, 4,493,815, Cl. 422-101.000.
La Motte, George B., III; and Burd, Samuel, 4,493,896, Cl. 435-287.000.

Birkett, Kevin; Scovell, Edward G.; and John, Glyn R., to Imperial Chemical Industries PLC. Corrosion inhibition. 4,493,876, Cl. 428-457.000.

Biss, Rudy, to Teck Corporation; and Soquem-Societe Quebecoise d'Exploration Miniere. Process for recovering pyrochlore mineral containing niobium and tantalum. 4,493,817, Cl. 423-62.000.

Bitting, Ricky F.; Peil, William; and Brown, Thomas A., to General Electric Company. Control circuit for an electronically commutated motor including reversing; method of operating an ECM including reversing. 4,494,055, Cl. 318-254.000.

Blamer, Robert H., to Bagcraft Corporation of America. Method of making tubular bag. 4,493,685, Cl. 493-235.000.

Bland, Timothy J.; and Niggemann, Richard E., to Sundstrand Corporation. Impingement cooling apparatus for heat liberating device. 4,494,171, Cl. 361-386.000.

Blanke, Richard H., Jr.; and Cale, Harold N., to Chase Bag Company. Carrying handle for heavy duty olefin bags. 4,493,127, Cl. 16-124.000.

Blaske, T. Allen; and Hendricks, Terry J., to Varo, Inc. Method and apparatus for fabricating a thermoelectric array. 4,493,939, Cl. 136-212.000.

Bleckmann, Gerhard: *See*—
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.

Blonder-Tongue Laboratories, Inc.: *See*—
Mistry, Kantilal, 4,494,142, Cl. 358-118.000.

Blu-Surf, Inc.: *See*—
Hanson, Lester A., 4,493,640, Cl. 432-72.000.

Board of Trustees, Univ. of Ill.: *See*—
Rinehart, Kenneth L., Jr., 4,493,796, Cl. 260-112.50R.

Bobo, Donald E.: *See*—
Borsanyi, Alexander S.; and Bobo, Donald E., 4,493,706, Cl. 604-153.000.

Boe, Einar: *See*—
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Boeing Company, The: *See*—
Hanger, Randolph T., 4,493,170, Cl. 51-330.000.
Kilner, Jerome R.; Raymond, Eugene T.; and Warren, Steven M., 4,493,509, Cl. 303-13.000.
Krezak, John E., 4,493,141, Cl. 29-509.000.

Bogdon, Glendon J. Orthodontic device and associated orthodontic method. 4,493,642, Cl. 433-5.000.

Bogner, Max; and Grun, Larry. Ring construction and method of making same. 4,493,196, Cl. 63-15.000.

Bohley, Peter: *See*—
Walter, Carlton H.; Bohley, Peter; and Couture, Robert P., 4,494,121, Cl. 343-708.000.

Bohmer, William; Betancourt, Walter J.; and Hoffman, Louis S., to Control Interface Company Limited. Field sensitive optical displays, generation of fields therefor and scanning thereof. 4,493,531, Cl. 350-336.000.

Boinot, Jean C.: *See*—
Lacour, Bernard; Euvrard, Hubert; Gaillard, Roger; and Boinot, Jean C., 4,493,646, Cl. 433-133.000.

Bolton, Roderick A., to W. R. Grace & Co., Cryovac Div. Method for making partially separated multibags. 4,493,684, Cl. 493-234.000.

Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., to American Hospital Supply Corporation. Wound drainage device of resilient sidewalls with a constant rate of recovery. 4,493,701, Cl. 604-73.000.

Bopp, Warren G., to Eaton Corporation. Viscous bypass coupling for torque converter. 4,493,406, Cl. 192-58.00B.

Borgia, Joseph, V. Winch for safely lowering a person at a controlled rate. 4,493,396, Cl. 182-238.000.

Borja, Jesus, to Illinois Tool Works, Inc. Strain relief. 4,493,467, Cl. 248-56.000.

Borriello, Gaetano: *See*—
Bell, Alan G.; Lyon, Richard F.; and Borriello, Gaetano, 4,494,021, Cl. 307-591.000.

Borsanyi, Alexander S.; and Bobo, Donald E., to American Hospital Supply Corporation. Linear peristaltic pumping apparatus and disposable casette therefor. 4,493,706, Cl. 604-153.000.

Bosch-Siemens Hausgeraete GmbH: *See*—
Bredel, Walter; Schenetin, Norbert; and Waigand, Helmut, 4,493,979, Cl. 219-446.000.

Bose, Amar G., to Bose Corporation. Feedback control. 4,494,074, Cl. 330-109.000.

Bose Corporation: *See*—
Bose, Amar G., 4,494,074, Cl. 330-109.000.

Bostater, Joseph A.; MacGregor, Angus J.; and Gesicki, Aaron A., to American Motors (Canada) Inc. Method for making cast iron engine blocks and the like. 4,493,359, Cl. 164-58.100.

Bouchet, Jean, to Bouchet-Lassale S.A. Reversible wrist watch. 4,493,561, Cl. 368-281.000.

Bouchet-Lassale S.A.: *See*—
Bouchet, Jean, 4,493,561, Cl. 368-281.000.

Boulton, Thomas W.; and Derwent, Brian J., to Imperial Chemical Industries PLC. Electrolytic cell. 4,493,759, Cl. 204-252.000.

Bound, Damon J. F., to F. F. Seeley Nominees Pty. Ltd. Switch. 4,493,953, Cl. 200-6.00B.

Bovone, Luigi. Chamfering machines, particularly for glass sheets. 4,493,167, Cl. 51-110.000.

Braatz, Andreas: *See*—
Paul, Jurgen; Braatz, Andreas; and Hanke, Hans, 4,493,293, Cl. 123-41.120.

Brackman, William D., Jr., to General Electric Company. Commutation detection apparatus and method. 4,494,182, Cl. 363-63.000.

Brady, C. Eugene; Gottsche, Marcus J.; and Stoll, Paul W., to Stanadyne, Inc. Fuel injection pump with plunger stroke control. 4,493,617, Cl. 417-214.000.

Bragg, James R., to Exxon Production Research Co. Method for improving injectivities of biopolymer solutions. 4,493,774, Cl. 252-8.55D.

Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Sullivan, John M., to AT&T Bell Laboratories. Deadlock detection and resolution scheme. 4,494,193, Cl. 364-200.000.

Brak, Stephen B., to United States of America, Energy. Bag-out material handling system. 4,493,179, Cl. 53-576.000.

Brandauer, Emil: *See*—
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,493,865, Cl. 428-52.000.

Brands, George B.: *See*—
Hyllberg, Bruce E.; and Brands, George B., 4,493,256, Cl. 101-216.000.

Branovich, Louis E.: *See*—
Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuske, Stanley, 4,494,003, Cl. 250-474.100.

Braun, Gerald W., to Magnavox Government and Industrial Electronics Company. One shot spring activated motor. 4,494,024, Cl. 310-75.00A.

Braverman, Leonard W.: *See*—
Guch, Steve, Jr.; Gardner, Phillip J.; Braverman, Leonard W.; and Jones, Robert W., 4,494,235, Cl. 372-23.000.

Braxton, Earl J. Collapsible toilet shelter. 4,493,118, Cl. 4-460.000.

Bredel, Walter; Schenetin, Norbert; and Waigand, Helmut, to Bosch-Siemens Hausgeraete GmbH. Control circuit assembly for heating elements in cooking plates. 4,493,979, Cl. 219-446.000.

Breeden, Kenneth S., to Caslin, Richard L. Caulking gun with cutter and piercer. 4,493,437, Cl. 222-82.000.

Brembilla, Almiro; and Pisani, Sergio C. Automatic steam box for textile articles. 4,493,160, Cl. 38-14.000.

Breuillard, Robert: *See*—
Pelletier, Joel A.; and Breuillard, Robert, 4,494,014, Cl. 307-254.000.

Breysse, Michele: *See*—
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Brezina, David C. Composite vehicle frames and method of manufacturing composite vehicle frames. 4,493,749, Cl. 156-187.000.

Briccetti, Mario F., to Carrier Corporation. Apparatus for controlling the operation of an indoor fan associated with an air conditioning unit. 4,493,194, Cl. 62-180.000.

Brickman, Norman F.; and Rosenbaum, Walter S., to International Business Machines Corporation. Word autocorrelation redundancy match facsimile compression for text processing systems. 4,494,150, Cl. 358-260.000.

Bridge, Andrew W.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, 4,493,843, Cl. 424-274.000.

Bridges, Mark E., to Eastman Kodak Company. Data recording photographic camera. 4,493,547, Cl. 354-424.000.

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Wedge, Philip J.; and Bridson, Robert C., 4,493,309, Cl. 126-91.00A.

Brinks, Robert J.: *See*—
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British Gas Corporation: *See*—
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British Petroleum Company, p.l.c., The: *See*—
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Brodie, Alastair C., to Glaxo Group Limited. Manufacture of antibiotics. 4,493,933, Cl. 548-194.000.

Brogardh, Torgny: *See*—
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Brokaw, Paul, to Loctite Corporation. Compartmental cartridge. 4,493,436, Cl. 222-80.000.

Broken Hill Proprietary Company Limited, The: *See*—
Godfrey, Noel R.; Parkes, Larry S.; and Treacy, Richard H., 4,494,050, Cl. 318-158.000.

Bron, Dan. Rotary sprinkler. 4,493,458, Cl. 239-230.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Kawahara, Hiroshi; and Nakamura, Kazuo, 4,493,569, Cl. 400-144.200.

Brown, Earl F., to AT&T Bell Laboratories. Reduced bandwidth video transmission. 4,494,144, Cl. 358-133.000.

Brown, Fred A., to Rotron Incorporated. Integral coaxial commutation and rotor magnets and apparatus and method for making same. 4,494,028, Cl. 310-156.000.

Brown, James L., to Rockwell International Corporation. Low level signal comparator apparatus. 4,494,019, Cl. 307-491.000.
Brown, Ronald D., to Caterpillar Tractor Co. Adaptive welder with laser TV-scanner. 4,493,968, Cl. 219-124.340.
Brown, Stanley M.; Durante, Vincent A.; Reagan, William J.; and Speronello, Barry K., to Engelhard Corporation. Fluid catalytic cracking catalyst comprising microspheres containing more than about 40 percent by weight Y-faujasite and methods for making. 4,493,902, Cl. 502-65.000.
Brown, Thomas A.: *See—*
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Brown, William B. Anti-theft lock for pedal operated apparatus. 4,493,198, Cl. 70-203.000.
Brown & Williamson Tobacco Corporation: *See—*
Porenski, Harry S., Jr., 4,493,331, Cl. 131-336.000.
Brudi Equipment, Inc.: *See—*
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,493,421, Cl. 211-13.000.
Brudi, Ronald A.: *See—*
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,493,421, Cl. 211-13.000.
Brunner, Hans-Georg: *See—*
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Brunswick Corporation: *See—*
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Brustad, Wayne L.: *See—*
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Bryson, John W.; and Hittenberger, William H., to Kliklok Corporation. Apparatus and method for forming and debowing cartons with pinching wheels. 4,493,682, Cl. 493-174.000.
Bucefari, Massimo; and Scortecci, Giuseppe, to ICM S.p.A. Italiana Costruzioni Metalmeccaniche. Machine for the manufacture of chains, in particular of the type known as rope chain in the goldsmithery industry. 4,493,183, Cl. 59-16.000.
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, to Robert Bosch GmbH. Electrical winding on fixed-mount laminated iron core subject to shaking. 4,494,101, Cl. 336-210.000.
Buckingham, Joseph T.: *See—*
Wang, Carl C. T.; Charles, Steve; and Buckingham, Joseph T., 4,493,698, Cl. 604-51.000.
Buckner, Leonard; Foll, William A., Sr.; and Pesho, Stephen W., to Euclid Spiral Paper Tube Corp. Packaging machine. 4,493,178, Cl. 53-131.000.
Buckwalter, Brian L.: *See—*
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Buddy L Corporation: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Avi, 4,493,671, Cl. 446-464.000.
Budinger, A. Bowman; Byszewski, Wojciech W.; and Proud, Joseph M., to GTE Laboratories Incorporated. Single cathode beam mode fluorescent lamp for DC use. 4,494,046, Cl. 315-260.000.
Bull Dog Tool Inc.: *See—*
Williams, Robert M.; and Davis, Bob, 4,493,383, Cl. 175-234.000.
Bunch, Earnest B., Jr. Paper roll feed rack for processing machine. 4,493,688, Cl. 493-413.000.
Bunn-O-Matic Corporation: *See—*
Stover, Kenneth W., 4,493,249, Cl. 99-275.000.
Burbank, John E., III; and Montgomery, John R., to Minnesota Mining and Manufacturing Company. Transport apparatus for microfiche cards. 4,493,540, Cl. 353-122.000.
Burck, Philip J.: *See—*
Zimmerman, Ronald E.; Burck, Philip J.; Jones, C. David; and Thakkar, Arvind L., 4,493,699, Cl. 604-55.000.
Burd, Samuel: *See—*
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La Motte, George B., III; and Burd, Samuel, 4,493,896, Cl. 435-287.000.
Burdeska, Kurt; Kabas, Guglielmo, deceased (by Kabas-Maskulinski, Anni, heir); Brunner, Hans-Georg; and Fory, Werner, to Ciba Geigy Corporation. Phenylpyrimidines as antidotes for protecting cultivated plants against phytotoxic damage caused by herbicides. 4,493,726, Cl. 71-87.000.
Burger, Wolfgang. Hair clip. 4,493,332, Cl. 132-46.00A.
Burkett, Albert L. Multi-purpose centrifugal mill. 4,493,459, Cl. 241-152.00A.
Burnett, John S. Support member. 4,493,877, Cl. 428-542.800.
Burroughs Corporation: *See—*
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Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,494,194, Cl. 364-200.000.
Hazel, Robert L.; and LaBudde, Edward V., 4,494,226, Cl. 369-45.000.
Buss, Albert, to G. O. Stumpf GmbH & Co. Kommanditgesellschaft. Apparatus for depositing a web of material on a table. 4,493,460, Cl. 242-58.600.
Butler, John C.: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.
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Butterfield, Ida M., to Butterfield Group. Hypodermic syringe cartridge with non-retractable drive piston. 4,493,703, Cl. 604-110.000.
Buzek, Eileen M.: *See—*
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Buzek, Eric W.; Buzek, Eileen M.; and Buzek, Frank R. Handle for compressor units. 4,493,618, Cl. 417-234.000.
Buzek, Frank R.: *See—*
Buzek, Eric W.; Buzek, Eileen M.; and Buzek, Frank R., 4,493,618, Cl. 417-234.000.
Byrum, Bernard J.: *See—*
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Cabot Medical Corporation: *See—*
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Cahill, Lysle D.: *See—*
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Calari, Alessandro, to Dideco S.P.A. Device for performing plasmapheresis by centrifugation. 4,493,691, Cl. 494-10.000.
Cale, Harold N.: *See—*
Blanke, Richard H., Jr.; and Cale, Harold N., 4,493,127, Cl. 16-124.000.
Calfo, Raymond: *See—*
Mulach, Arthur; and Calfo, Raymond, 4,494,030, Cl. 310-256.000.
Call, Mark G., to International Business Machines Corporation. Voltage-controlled oscillator with independent gain and frequency controls. 4,494,080, Cl. 331-8.000.
Callahan, Kevin M., to International Paper Company. Applying an adhesive strip to a container interior. 4,493,860, Cl. 427-230.000.
Callen, Patrick J.; and Pierce, Philip R., to RCA Corporation. Satellite dual bus power system. 4,494,063, Cl. 320-56.000.
Camden, Thomas M.: *See—*
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Campbell, John R.: *See—*
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Campbell, Valtin T., Jr. Car body guard. 4,493,502, Cl. 293-128.000.
Canadian Patents & Development Limited: *See—*
Barszczewski, Andrzej, 4,494,067, Cl. 324-79.00D.
Cannon, Mark W., Jr., to United States of America, Air Force. Method and apparatus for objective determination of visual contrast sensitivity functions. 4,493,539, Cl. 351-205.000.
Canon Kabushiki Kaisha: *See—*
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Kaneko, Shuzo; Tamura, Yasuyuki; and Takahashi, Tohru, 4,493,882, Cl. 430-97.000.
Kataoka, Hiroyuki, 4,494,044, Cl. 315-151.000.
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Capalvo, Enzo: *See—*
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Carabateas, Eustratios N. Ballistic propulsion system. 4,493,263, Cl. 102-483.000.
Carignan, Forest J.; and Cook, Nathan H., to Advanced Mechanical Technology, Inc. Force measuring platform and load cell therefor using strain gages to measure shear forces. 4,493,220, Cl. 73-862.660.
Carlson, David J.: *See—*
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Carrier Corporation: *See—*
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Stenglein, Paul R., 4,493,499, Cl. 292-158.000.
Carroll, Thomas J.; Rubin, Michael; Piccolo, Dominic J.; and Glass, Michael, to Warner-Lambert Company. Process for preparing a non-chalky, organoleptically pleasing chewing gum composition. 4,493,849, Cl. 426-3.000.
Carson, William J., to Koppers Company, Inc. Method and apparatus for applying a multi-component adhesive. 4,493,286, Cl. 118-677.000.
Carter, Daniel L.; and Hall, Homer H., to General Electric Company. Pistol grip electrical brazing tool. 4,493,986, Cl. 219-85.00D.
Caruso, Fred A.: *See—*
Long, Robert B.; and Caruso, Fred A., 4,493,765, Cl. 208-309.000.
Caslin, Richard L.: *See—*
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Cassou, Bertrand: *See—*
Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand, 4,493,700, Cl. 604-55.000.
Cassou, Maurice: *See—*
Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand, 4,493,700, Cl. 604-55.000.
Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand. Protective sheath for an artificial insemination gun, in particular for bovines. 4,493,700, Cl. 604-55.000.
Castle, Richard B.: *See—*
Beck, Warren R.; and Castle, Richard B., 4,493,875, Cl. 428-403.000.

Catchen, Gary L., to Conoco Inc. Method of energy resolved gamma-ray logging. 4,493,999, Cl. 250-260.000.

Caterpillar Tractor Co.: *See*—
Brown, Ronald D., 4,493,968, Cl. 219-124.340.
Fuzzell, Joe E., 4,494,096, Cl. 335-170.000.

Chaldar, Inc.: *See*—
Galahad, Giles, 4,493,225, Cl. 74-551.300.

Challenger Circle F, Inc.: *See*—
Leong, Henry; and Fiumefreddo, John, 4,493,523, Cl. 339-105.000.

Chambers, Samuel W.: *See*—
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Champeau, Andre . Hybrid transmissive focalizing optical system. 4,493,535, Cl. 350-452.000.

Champseix, Alain A.; and Le Fur, Gerard R., to Pharmindustrie. Medicaments containing derivatives of 3-chloro-quinoline. 4,493,838, Cl. 424-258.000.

Chan, Hardy W.: *See*—
Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., 4,493,795, Cl. 260-112.50E.

Chandler Evans Inc.: *See*—
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Nelson, James C., 4,493,623, Cl. 418-94.000.

Chaney, Mary B.: *See*—
Stapp, Paul R.; and Chaney, Mary B., 4,493,370, Cl. 166-273.000.

Chang, Hsiao-Nan L.; and Cline, John A., to General Electric Company. Dual turbine controller. 4,494,207, Cl. 364-494.000.

Chang, Hsiao-Nan L., to General Electric Company. Bumpless switching of valve drive in a turbine control system. 4,494,208, Cl. 364-494.000.

Chapman, Francis E.; and Harris, Robert B., to S. C. Johnson & Son, Inc. Powdered cleansing composition. 4,493,781, Cl. 252-88.000.

Chapman, Robert F.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, 4,493,843, Cl. 424-274.000.

Charles, Steve: *See*—
Wang, Carl C. T.; Charles, Steve; and Buckingham, Joseph T., 4,493,698, Cl. 604-51.000.

Chase Bag Company: *See*—
Blanke, Richard H., Jr.; and Cale, Harold N., 4,493,127, Cl. 16-124.000.

Chattha, Mohinder S., to Ford Motor Company. Stabilized dispersion of cross-linked polymer particles. 4,493,914, Cl. 523-436.000.

Chekroun, Isaac; and Heymes, Alain, to Sanofi. Process for the preparation of β-cyclo-substituted ethylamines. 4,493,931, Cl. 546-329.000.

Chemco Manufacturing Co., Inc.: *See*—
Schweizer, Randy, 4,493,718, Cl. 55-491.000.

Chen, Lee; Khoury, Henri A.; and Seymour, Harlan R., to International Business Machines Corporation. Optical emission spectroscopy end point detection in plasma etching. 4,493,745, Cl. 156-626.000.

Cherdron, Harald; Gordon, Wolfgang; and Kloos, Friedrich, to Hoechst Aktiengesellschaft. Polyoxymethylene fibrids, a process for their production and their use. 4,493,751, Cl. 162-157.200.

Cherish, Peter: *See*—
Haldipur, Gaurang B.; Anderson, Richard G.; and Cherish, Peter, 4,493,636, Cl. 431-170.000.

Cherne Industries, Inc.: *See*—
Mathison, Allen D.; Nelson, Dale K.; and Cherne, Lloyd G., 4,493,344, Cl. 138-89.000.

Cherne, Lloyd G.: *See*—
Mathison, Allen D.; Nelson, Dale K.; and Cherne, Lloyd G., 4,493,344, Cl. 138-89.000.

Chevron Research Company: *See*—
Streib, Stephen F., 4,494,112, Cl. 340-606.000.

Chicago Bridge & Iron Company: *See*—
Sie, Swan K., 4,493,430, Cl. 220-224.000.

Childers, Frederick K.: *See*—
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.

Chin, Albert K.; and Fogarty, Thomas J., to Fogarty, Thomas J. Tubular extrusion catheter. 4,493,711, Cl. 604-271.000.

Chitayat, Anwar; Goldstein, Robert C.; and Faizullabhoy, Mustansir A., to Anorad Corporation. Axis controller for robotic actuator. 4,494,060, Cl. 318-568.000.

Cho, Sung N. Can opening means. 4,493,431, Cl. 220-269.000.

Christiansen, David W.; and Schively, Dixon P., to United States of America, Energy. Nuclear radiation actuated valve. 4,493,812, Cl. 376-352.000.

Christidis, Yani: *See*—
Gallois, Philippe; and Christidis, Yani, 4,493,937, Cl. 562-444.000.

Christie, Howard W.: *See*—
Langan, Ervin C.; and Christie, Howard W., 4,493,162, Cl. 47-57.600.

Christopher, Todd J.: *See*—
Kelleher, Kevin C.; Kiser, Ned J.; and Christopher, Todd J., 4,494,052, Cl. 318-254.000.

Chu, Albert E., to E-Y Laboratories. Soluble immunoassay reagent comprising lectin covalently bonded to reactive component. 4,493,793, Cl. 260-112.00R.

Chu, Raymond D.; and Bergman, Marc A., to Lifecare Services, Inc. Pump for a portable ventilator. 4,493,614, Cl. 417-22.000.

Chupp, John P.: *See*—
Goodin, Richard D.; and Chupp, John P., 4,493,755, Cl. 204-73.00R.

Ciba Geigy Corporation: *See*—
Beffa, Fabio, 4,493,798, Cl. 534-697.000.
Burdeska, Kurt; Kabas, Guglielmo, deceased; Brunner, Hans-Georg; and Fory, Werner, 4,493,726, Cl. 71-87.000.

Cimochowski, Anthony E., to Manville Service Corporation. Insulation module mounting means. 4,493,176, Cl. 52-508.000.

Ciracco Metal Fabricating Co., Inc.: *See*—
Ganek, Jerome S.; and Ganek, Lee G., 4,493,974, Cl. 219-341.000.

Citizen Watch Co., Ltd.: *See*—
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,493,560, Cl. 368-88.000.

City of Hope: *See*—
Smith, Lloyd H.; and Teplitz, Raymond L., 4,493,899, Cl. 436-508.000.

Clair, Robert A.: *See*—
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.

Clark, Charles W., to Ederer Incorporated. Hoist drive safety system. 4,493,479, Cl. 254-274.000.

Clark, John I., to Pitney Bowes Inc. Postage printing apparatus having a movable print head in a print drum. 4,493,252, Cl. 101-71.000.

Clark, Stephen D.; Wood, Philip S.; and Fell, Peter J., to Rolls-Royce Limited. Filling fissures in metal articles. 4,493,451, Cl. 228-119.000.

Clarke, Donald A.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,493,554, Cl. 356-241.000.

Clausen, Herbert J., to Gardinier, Inc. Process for partial removing of impurities from a wet process phosphoric acid. 4,493,820, Cl. 423-310.000.

Clemen, Rainer; and Haug, Werner, to International Business Machines Corporation. Bootstrapped level shift interface circuit with fast rise and fall times. 4,494,018, Cl. 307-482.000.

Cleveland, Dixon: *See*—
Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., 4,493,965, Cl. 219-109.000.

Cline, John A.: *See*—
Chang, Hsiao-Nan L.; and Cline, John A., 4,494,207, Cl. 364-494.000.

Coburn Optical Industries, Inc.: *See*—
Field, Edgar L., Jr., 4,493,168, Cl. 51-165.870.

Coca-Cola Company, The: *See*—
Sedam, Jason K.; Mueller, Richard J.; and Holoubek, Andrew J., 4,493,441, Cl. 222-129.100.

Codex Corporation: *See*—
Payton, John I., 4,494,240, Cl. 375-75.000.

Coffey, M. Dewayne; Kelly, Mary Y.; and Kennedy, Weldon C., Jr., to Dow Chemical Company, The. Method and composition for corrosion. 4,493,775, Cl. 252-8.55C.

Cohen, Paul B.: *See*—
Bahr, Richard G.; and Cohen, Paul B., 4,494,233, Cl. 370-86.000.

Coker, Charles W., to Intermatic Incorporated. Switch timer. 4,494,012, Cl. 307-132.00E.

Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., to Occidental Chemical Corporation. Microbial degradation of obnoxious organic wastes into innocuous materials. 4,493,895, Cl. 435-262.000.

Coleman, David E.: *See*—
White, Allan E.; Coleman, David E.; and Miller, Steven R., 4,493,651, Cl. 434-188.000.

Coleman, H. Paris, to United States of America, Navy. Dual sense, circularly polarized helical antenna. 4,494,117, Cl. 343-365.000.

Coleman, Jeffrey L., to United States of America, Navy. Shallow depth lead weight ejection circuit. 4,493,281, Cl. 114-20.00R.

Colgate-Palmolive Company: *See*—
Joshi, David P., 4,493,786, Cl. 252-368.000.

Collier, Owen N.; and Selman, Gordon L., to Johnson Matthey PLC. Brazing alloy composition. 4,493,738, Cl. 148-24.000.

Collins, Robert A.; and Lewis, Timothy A., to Gus Pech Manufacturing Co. Vehicle-mounted earth drilling apparatus. 4,493,382, Cl. 175-206.000.

Collis, George C. Toothbrush with curved bristles. 4,493,125, Cl. 15-167.00A.

Colman OEM, Inc.: *See*—
Wielgus, Charles D., 4,493,955, Cl. 200-38.00R.

Colt Industries Operating Corp: *See*—
Klein, Harold A., 4,493,595, Cl. 408-46.000.

Combustion Engineering, Inc.: *See*—
Comeau, Joseph H.; Kowles, Joseph E.; Lareau, John P.; Mayo, Kenneth R.; and Runde, Herbert A., 4,493,155, Cl. 33-366.000.
Francis, Alex W., Jr., 4,493,591, Cl. 405-198.000.
Musto, Richard L.; and Kai, Norichika, 4,493,269, Cl. 110-106.000.

Comeau, Joseph H.; Kowles, Joseph E.; Lareau, John P.; Mayo, Kenneth R.; and Runde, Herbert A., to Combustion Engineering, Inc. Apparatus for remotely indicating angular position. 4,493,155, Cl. 33-366.000.

Commissariat a l'Energie Atomique: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,493,598, Cl. 414-1.000.
Loriot, Pierre; Rendu, Michel; and Rousseau, Jean, 4,493,813, Cl. 376-409.000.

Peuzin, Jean C., 4,493,563, Cl. 374-121.000.

Commonwealth of Australia, The: *See*—
Ludowyk, Christopher J., 4,494,013, Cl. 307-241.000.

Compagnie Francaise des Petroles: *See*—
de Sivry, Bruno; Sudreau, Bernard; Jegousse, Michel; and Le Hir, Yves, 4,493,966, Cl. 219-121.0EC.

Compressor Controls Corporation: *See*—
Staroselsky, Naum; and Mirsky, Saul, 4,494,006, Cl. 290-4.000.

ComSonics, Inc.: *See*—
Shimp, Richard L., 4,494,138, Cl. 358-86.000.

Conjerti, Samuel N.: *See*—
Groutage, Frederick D.; Conjerti, Samuel N.; and Shaw, Lockburn S., 4,493,136, Cl. 24-573.000.

Conoco Inc.: *See*—
Catchen, Gary L., 4,493,999, Cl. 250-260.000.
Mack, Mark P., 4,493,903, Cl. 502-121.000.
Mack, Mark P., 4,493,904, Cl. 502-122.000.
Radd, Fred J.; Scott, James B.; and Pan, Robert B., 4,493,372, Cl. 166-285.000.

Consan Pacific Incorporated: *See*—
Saurenman, Donald G., 4,493,289, Cl. 119-21.000.

Contitronix, Inc.: *See*—
McMahon, Ronald G.; and Hale, Donnie E., 4,493,566, Cl. 400-59.000.

Control Interface Company Limited: *See*—
Bohmer, William; Betancourt, Walter J.; and Hoffman, Louis S., 4,493,531, Cl. 350-336.000.

Cook, Kenneth P., to Site Microsurgical Systems, Inc. Opthalmic microsurgical system cassette assembly. 4,493,695, Cl. 604-27.000.

Cook, Nathan H.: *See*—
Carignan, Forest J.; and Cook, Nathan H., 4,493,220, Cl. 73-862.660.

Cook, Raymond. Magnetic motor machine. 4,494,023, Cl. 310-21.000.

Cook, Thomas E.; and Dolle, Ernest W., to Procter & Gamble Company, The. Low phosphate, softening laundry detergent containing ethoxylated nonionic, alkylpolysaccharide and cationic surfactants. 4,493,773, Cl. 252-8.800.

Cooper LaserSonics, Inc.: *See*—
Wuchinich, David G., 4,493,694, Cl. 604-22.000.

Cooper Medical Devices: *See*—
Wang, Carl C. T.; Charles, Steve; and Buckingham, Joseph T., 4,493,698, Cl. 604-51.000.

Coppola, Joseph C., Jr., to Pantasote Inc. Roofing system. 4,493,175, Cl. 52-410.000.

Corning Glass Works: *See*—
Nayak, Ashok L.; and Spremulli, Paul F., 4,493,557, Cl. 366-300.000.

Corry, Jon C., to Mason Corporation. Window sash positioner. 4,493,128, Cl. 16-197.000.

Cosentino, Cesare C.: *See*—
Hatzikelis, Christopher; Madonia, Ciro; and Cosentino, Cesare C., 4,493,806, Cl. 264-28.000.

Cosenza, Frank J., to Rexnord Inc. Double disc stud assembly for thin walled panels. 4,493,577. Cl. 403-41.000.

Coughlin, William J.: *See*—
Rieppel, Perry J.; and Coughlin, William J., 4,493,970, Cl. 219-137.410.

Coulter Systems Corp.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.

Couture, Robert P.: *See*—
Walter, Carlton H.; Bohley, Peter; and Couture, Robert P., 4,494,121, Cl. 343-708.000.

Couvillion, Mark C., to Dow Chemical Company, The. Catalyst for the selective hydrogenation of acetylenes. 4,493,906, Cl. 502-346.000.

Cowdrey, Dennis A., to Singer Company, The. Weather radar simulator. 4,493,647, Cl. 434-2.000.

CPC International Inc.: *See*—
Mielenz, Jonathan R.; and Mickel, Susan, 4,493,893, Cl. 435-172.300.

Crandall, Stanley C.: *See*—
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Trobes, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.

Crawford, Lynn; and McArthur, William A. Implantable electrode having different stiffening and curvature maintaining characteristics along its length. 4,493,329, Cl. 128-786.000.

Cremonesi, Pietro: *See*—
Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, 4,493,829, Cl. 424-177.000.

Crevel, Philippe, to Motorola, Inc. Process and device for servo-control. 4,494,184, Cl. 364-178.000.

Cronin, David V., to Polaroid Corporation. Processing apperatus and method for treating a film unit with a liquid. 4,493,546, Cl. 354-324.000.

Cronin, Michael J., to Lockheed Corporation. Quick attach detach instrument panel method. 4,493,146, Cl. 29-857.000.

Crook, Edward J., Jr., to Crosby Group, Inc., The. Fitting for connection with web-type strapping. 4,493,135, Cl. 24-197.000.

Crook, Stephen E.: *See*—
Rocci, Joseph D.; Crook, Stephen E.; and Kauffman, Marc, 4,494,111, Cl. 340-533.000.

Crosby Group, Inc., The: *See*—
Crook, Edward J., Jr., 4,493,135, Cl. 24-197.000.

Cross, Carroll N. Process of making raised line imprinted display mounts. 4,493,748, Cl. 156-79.000.

Crown Zellerbach Corporation: *See*—
Schutz, Rudolph W.; and Weis, Rudolf R., 4,493,159, Cl. 34-43.000.

Crutcher Resources Corporation: *See*—
Wheeler, Lionel H.; Goekler, Robert G.; and Luddeke, Daniel G., 4,493,203, Cl. 72-369.000.

Cubic Corporation: *See*—
Sorgi, Aladino D., 4,494,073, Cl. 328-14.000.

Culbertson, E. C.: *See*—
Funderburk, F. Gene; Culbertson, E. C.; and Posey, Robert G., 4,493,872, Cl. 428-332.000.

Cullen, Steven R. Material handling apparatus for loaders. 4,493,605, Cl. 414-726.000.

Cupani, Carmine: *See*—
Sues, John M.; and Cupani, Carmine, 4,493,948, Cl. 179-2.00A.

Curtis, Joe E., Jr.: *See*—
Fisher, John L.; and Curtis, Joe E., Jr., 4,494,102, Cl. 336-212.000.

Custance, Robert E.: *See*—
Satchell, Terry L.; and Custance, Robert E., 4,493,493, Cl. 280-661.000.

CXA Ltd./CXA LTEE: *See*—
Simon, James R.; and Welburn, David J., 4,493,261, Cl. 102-331.000.

Cyclops Corporation: *See*—
Krantz, Robert J., 4,493,859, Cl. 427-193.000.

Daikin Kogyo Co., Ltd.: *See*—
Furutaka, Yasuhisa; and Ishii, Sadamu, 4,493,800, Cl. 260-465.00D.

Daimler-Benz AG: *See*—
Merkle, Josef, 4,493,481, Cl. 267-64.270.

Daimler-Benz Aktiengesellschaft: *See*—
Paul, Jurgen; Braatz, Andreas; and Hanke, Hans, 4,493,293, Cl. 123-41.120.

Dairiki, Osamu; Ookuma, Humio; and Asano, Hiroyuki, to Nippon Steel Corporation. Method of rolling metal. 4,494,205, Cl. 364-472.000.

Dale, John R., to United States of America, Navy. Sonobuoy float inflation and depth selection initiators. 4,493,664, Cl. 441-7.000.

D'Alessio, Michael S., to Harsco Corporation. Scaffolding connector and system. 4,493,578, Cl. 403-49.000.

Dalibout, Georges, to WABCO Westinghouse Equipements Ferroviaires. Brake cylinder with two pistons. 4,493,246, Cl. 92-13.800.

Dambrackas, William A.; Marshall, Michael B.; Greenstein, Larry S.; and Downie, Alex, to Racal-Milgo, Inc. Statistical multiplexer with dynamic bandwidth allocation for asynchronous and synchronous channels. 4,494,232, Cl. 370-80.000.

Danforth, Richard L.: *See*—
Durbin, Daniel P.; Lutz, Robert G.; and Danforth, Richard L., 4,493,919, Cl. 524-505.000.

D'Anna, Frank P., to United Technologies Corporation. Axially slideable plenum for circulation control aircraft. 4,493,612, Cl. 416-20.00R.

Dansk Svejsemaskine Fabrik A/S: *See*—
Peronard, Pierre-Rene, 4,494,070, Cl. 324-208.000.

Dataface Limited: *See*—
Gibbard, David W., 4,493,290, Cl. 119-51.00R.

Dauphin, Jean L.: *See*—
Slawy, Serge; Louvet, Olivier F.; and Dauphin, Jean L., 4,494,231, Cl. 370-60.000.

Davenport, John M., to General Electric Company. Ballast circuit for a 220-volt improved lighting unit. 4,494,045, Cl. 315-247.000.

Davies, Jeffrey N., to Allied Corporation. Electrical push-pull connector. 4,493,520, Cl. 339-91.00P.

Davila, Jose E.: *See*—
Giebelhausen, Charles W.; and Davila, Jose E., 4,493,454, Cl. 232-15.000.

Davis, Bob: *See*—
Williams, Robert M.; and Davis, Bob, 4,493,383, Cl. 175-234.000.

Davis, Stephen J. High voltage nanosecond pulse generator. 4,494,011, Cl. 307-106.000.

Dayco Corporation: *See*—
Miranti, Joseph P., Jr., 4,493,679, Cl. 474-201.000.

De La Rue Systems Limited: *See*—
Hilton, Graham H., 4,493,994, Cl. 250-223.00R.

Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Infrared sensitive photo diode. 4,494,133, Cl. 357-30.000.

Decina, Basil A., Jr.: *See*—
Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., 4,493,965, Cl. 219-109.000.

de Cremoux, Baudouin: *See*—
Di Forte Poisson, Marie-Antoinette; Hirtz, Jean-Pierre; Duchemin, Jean-Pascal; and de Cremoux, Baudouin, 4,494,237, Cl. 372-45.000.

Deere & Company: *See*—
Winter, David C.; Pearson, Michael L.; and Long, John D., 4,493,375, Cl. 172-1.000.

Degen, Peter J.; and Gsell, Thomas C., to Pall Corporation. Process for cleaning metal filters. 4,493,756, Cl. 204-141.500.

Dehn, Dieter: *See*—
Grunsky, Manfred; Sussmuth, Reiner; Dehn, Dieter; and Ischen, Gunter, 4,493,596, Cl. 408-233.000.
Deike, Karl-Heinz; Schulz, Hans-Joachim; and Sandmann, Jurgen, to WABCO Fahrzeugbremsen GmbH. Brake pressure control valve for tractor-trailer vehicles. 4,493,510, Cl. 303-28.000.
Del Bon, Franco: *See*—
Del Bon, Luigi; and Del Bon, Franco, 4,493,444, Cl. 222-402.220.
Del Bon, Luigi; and Del Bon, Franco. Self-closing valve-and-lid assembly. 4,493,444, Cl. 222-402.220.
Del Brocco, Enzo: *See*—
Sideri, Leonardo; and Del Brocco, Enzo, 4,493,433, Cl. 220-306.000.
DeLong, Charles E.; and Eck, Gary A., to Kimball International, Inc. Electronic piano. 4,493,237, Cl. 84-1.260.
Delphax Systems: *See*—
Gretchev, Vladimir, 4,494,129, Cl. 346-154.000.
Del Rosario, Luis. Speaker assembly. 4,493,389, Cl. 181-152.000.
de Monbrison, Christian, to Agro-Technics International Ltd. Hydroponic culture method for animal food and device for carrying out said method. 4,493,163, Cl. 47-61.000.
Dempsey, John C., to Taggents, Inc. Method and apparatus for measuring the rate at which air infiltrates into and out of buildings. 4,493,207, Cl. 73-40.700.
Dennis, Timothy J., to Lockwood Graders (U.K.) Limited. Method and apparatus for detecting bounded regions of images, and method and apparatus for sorting articles and detecting flaws. 4,493,420, Cl. 209-587.000.
de Reinach Hirtzbach, Francois; and Ambrosi, Dominique, to Rhone-Poulenc Agrochimie. N-Phenylcarbamoyl-pyridine compounds. 4,493,729, Cl. 71-94.000.
Derungs, Romano, to Hoffmann-La Roche Inc. Blood-platelet aggregation inhibiting 4,5,7,8-tetrahydro-4,4,8,8-tetramethyl-2-thienyl-1H-thiepino[4,5-d]imidazole derivatives. 4,493,841, Cl. 424-273.00R.
Derwent, Brian J.: *See*—
Boulton, Thomas W.; and Derwent, Brian J., 4,493,759, Cl. 204-252.000.
de Sivry, Bruno; Sudreau, Bernard; Jegousse, Michel; and Le Hir, Yves, to Compagnie Francaise des Petroles. Internal mandrel used in an operation of butt joining two lengths of tubing by welding. 4,493,966, Cl. 219-121.0EC.
Deutsch Company Electronic Components Division, The: *See*—
Griffin, Alan L., 4,494,092, Cl. 333-182.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Engler, Rolf; and Wulf, Rudolf, 4,493,217, Cl. 73-861.270.
Oliva, Rudolf; and Schmidt, K. Ulf, 4,493,241, Cl. 89-1.140.
DeVault, Donald G.: *See*—
Morrell, David J.; DeVault, Donald G.; and Sands, William K., Jr., 4,494,224, Cl. 367-2.000.
de Vries, Gerhard H. F., to U.S. Philips Corporation. Gas discharge display device having anodized and unanodized electrode surface areas. 4,494,037, Cl. 313-584.000.
Diab Barracuda AB: *See*—
Karlsson, Lars G., 4,493,863, Cl. 428-17.000.
Dideco S.P.A.: *See*—
Calari, Alessandro, 4,493,691, Cl. 494-10.000.
Dieckmann, J. Robert; Lauber, Michael L.; and Roodvoets, Mark R., to Firestone Tire & Rubber Company, The. Apparatus for producing variable-rate spring. 4,493,631, Cl. 425-292.000.
Diesel Kiki Co., Ltd.: *See*—
Iio, Masahiro, 4,493,624, Cl. 418-98.000.
Diffracto: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,493,554, Cl. 356-241.000.
Di Forte Poisson, Marie-Antoinette; Hirtz, Jean-Pierre; Duchemin, Jean-Pascal; and de Cremoux, Baudouin, to Thomson-CSF. Short-wave semiconductor laser. 4,494,237, Cl. 372-45.000.
Dilworth, James L.; and Brinks, Robert J., to Nubs Nob, Inc. Method and apparatus for making artificial snow. 4,493,457, Cl. 239-25.000.
Dippert, Rainer: *See*—
Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, 4,493,234, Cl. 83-175.000.
Ditton, Louis G., to Essex Group, Inc. Spool with lifting handles. 4,493,462, Cl. 242-118.610.
Dr. Ing. h.c.F. Porsche AG: *See*—
Lehmann, Ulrich, 4,494,199, Cl. 364-426.000.
Dr. Ing. h.c.F. Porsche A.G.: *See*—
Ampferer, Herbert, 4,493,295, Cl. 123-41.860.
Doherty, James B.; Zimmerman, Morris; and Ashe, Bonnie M., to Merck & Co., Inc. 1-Carbapenem-3-carboxylic esters as anti-inflammatory agents. 4,493,839, Cl. 424-263.000.
Dolan, John P.: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Juergens, Tristan, 4,493,221, Cl. 474-14.000.
Dolle, Ernest W.: *See*—
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Dombay, Zsolt: *See*—
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.
DonJoy, Inc.: *See*—
Reed, Kenneth E.; Mason, Bradley; Mason, Jeff; and Nelson, Gregory R., 4,493,316, Cl. 128-80.00C.
Donnelly, Albert J., to Standum Controls, Inc. Programmable power control apparatus responsive to load variations. 4,494,010, Cl. 307-33.000.
Dotson, Billy J.: *See*—
Odeh, Aziz S.; and Dotson, Billy J., 4,493,369, Cl. 166-261.000.
Doty, John S., to Hughes Aircraft Company. Electromagnetic energy signal-carrying connector having secure strain-relief mechanism. 4,493,529, Cl. 350-96.200.
Dow Chemical Company, The: *See*—
Coffey, M. Dewayne; Kelly, Mary Y.; and Kennedy, Weldon C., Jr., 4,493,775, Cl. 252-8.55C.
Couvillion, Mark C., 4,493,906, Cl. 502-346.000.
Fisk, Thomas E., 4,493,908, Cl. 521-137.000.
Fujie, Akira; and Hisamatsu, Minoru, 4,493,788, Cl. 252-511.000.
Gross, James R., 4,493,818, Cl. 423-240.000.
McCreedy, Kathleen M.; and Hilton, Kenneth R., 4,493,927, Cl. 528-381.000.
Pews, Richard G., 4,493,929, Cl. 544-242.000.
Snyder, Kenneth L., Jr.; and Peters, James, 4,493,777, Cl. 252-49.300.
Werner, John A., 4,493,932, Cl. 546-345.000.
Wilson, David A.; and Wilson, Wilfred W., 4,493,771, Cl. 210-700.000.
Woo, Edmund P., 4,493,799, Cl. 260-465.00H.
Downie, Alex: *See*—
Dambrackas, William A.; Marshall, Michael B.; Greenstein, Larry S.; and Downie, Alex, 4,494,232, Cl. 370-80.000.
Drabsch, Karl S. Tenon joint for wooden frames. 4,493,582, Cl. 403-382.000.
Dragagna, Claudio; and Locatelli, Claudio, to Fratelli Marzoli & C. S.P.A. Control device for opening fiber bales. 4,493,131, Cl. 19-80.00R.
Dragagna, Claudio; and Locatelli, Claudio, to F. LLI Marzoli & C. S.p.A. Device for condensing the fleece emerging from a carding engine. 4,493,132, Cl. 19-106.00R.
Dragerwerk Aktiengesellschaft: *See*—
Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl F., 4,493,318, Cl. 128-200.190.
Dresser Industries, Inc.: *See*—
Fertl, Walter H., 4,494,071, Cl. 324-338.000.
Duberg, John E.: *See*—
Fisher, Ralph H., 4,493,193, Cl. 62-160.000.
DuBuske, Stanley: *See*—
Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuske, Stanley, 4,494,003, Cl. 250-474.100.
Duchemin, Jean-Pascal: *See*—
Di Forte Poisson, Marie-Antoinette; Hirtz, Jean-Pierre; Duchemin, Jean-Pascal; and de Cremoux, Baudouin, 4,494,237, Cl. 372-45.000.
Ducote, Marjorie E.; and Allen, Henry C., to United States of America, Army. Amine salts as bonding agents. 4,493,741, Cl. 149-19.400.
Dudgeon, Charles D.; and Winstead, Maynard R., to General Electric Company. Electromagnetic wave attenuating composition. 4,493,912, Cl. 523-137.000.
Duffy, Gifford R. Non-clogging eaves trough. 4,493,588, Cl. 405-119.000.
Duke, Ronald J.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.
Dumbri, Austin C.; and Procyk, Frank J., to AT&T Bell Laboratories. Folded bit line memory with one decoder per pair of spare rows. 4,494,220, Cl. 365-200.000.
Dupont, Bernard: *See*—
Bailleux, Christian; Bernard, Michel; Dupont, Bernard; Lozach, Guy; and Mata, Jean-Pierre, 4,493,917, Cl. 524-394.000.
Durante, Vincent A.: *See*—
Brown, Stanley M.; Durante, Vincent A.; Reagan, William J.; and Speronello, Barry K., 4,493,902, Cl. 502-65.000.
Durbin, Daniel P.; Lutz, Robert G.; and Danforth, Richard L., to Shell Oil Company. Polymer blend composition comprising two block polymers a vinyl aromatic copolymer and a polyester. 4,493,919, Cl. 524-505.000.
Duret, Jean, to Les Cables de Lyon. Device for connecting together the outer conductors of two coaxial pairs. 4,493,946, Cl. 174-88.00C.
Dursch, Walter: *See*—
Kleiner, Hans-Jerg; and Dursch, Walter, 4,493,803, Cl. 260-968.000.
Dusel, Robert O.; Berres, James J.; and Keene, Harold J., to Artos Engineering Company. Apparatus for cutting and conveying segments of wire or cable. 4,493,233, Cl. 83-71.000.
Dwyer, Daniel T.: *See*—
Streater, August L.; and Dwyer, Daniel T., 4,494,180, Cl. 363-37.000.
Dydyk, Michael, to Motorola, Inc. Transmission line oscillator having independently adjustable Q and input resistance. 4,494,086, Cl. 331-96.000.
Dydyk, Michael; Enlow, Norman K.; and Tuzzolino, Joseph R., to Motorola, Inc. Combiner probe providing power flatness and wide locking bandwidth. 4,494,087, Cl. 331-107.0DP.
Dyson, John A.: *See*—
Albright, John P.; Martin, Robert K.; and Dyson, John A., 4,493,323, Cl. 128-340.000.
E-Y Laboratories: *See*—
Chu, Albert E., 4,493,793, Cl. 260-112.00R.

Eastman Kodak Company: *See—*
Ateya, Antoun I., 4,493,548, Cl. 355-3.0FU.
Bridges, Mark E., 4,493,547, Cl. 354-424.000.
Mitchell, John D.; and Michel, Stephen, 4,493,881, Cl. 430-42.000.
Piatt, Michael J.; and Williams, Theodore F., 4,494,124, Cl. 346-1.100.
Romansky, John A., 4,493,982, Cl. 219-469.000.
Veillard, Dominique H., 4,494,155, Cl. 360-47.000.

Eaton Corporation: *See—*
Bopp, Warren G., 4,493,406, Cl. 192-58.00B.
Rolf, Jeffrey O., 4,493,597, Cl. 411-198.000.
Speelman, Paul L., 4,493,224, Cl. 74-473.00R.
Wenker, Wayne B., 4,493,404, Cl. 192-4.00A.

Eaton, James H. Parabolic trough solar collector. 4,493,313, Cl. 126-438.000.

Ebneth, Harold: *See—*
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,493,861, Cl. 427-304.000.

Echte, Adolf; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Impact-resistant thermoplastic molding material. 4,493,922, Cl. 525-71.000.

Echtler, Theodor; Quinot, Martin; and Hunsinger, Werner, to IBEK Ingenieurbuero Echtler Kaiserslautern GmbH. Motor vehicle for transporting and laying a fixed bridge. 4,493,122, Cl. 14-2.400.

Echtler, Theodor, to IBEK Ingenieurbuero Echtler Kaiserslautern GmbH. Pontoon for floating bridges and ferries. 4,493,284, Cl. 114-267.000.

Eck, Gary A.: *See—*
DeLong, Charles E.; and Eck, Gary A., 4,493,237, Cl. 84-1.260.

Eckelt, Ulrich; and Winnemoller, Alois, to Windmoller & Holscher. Apparatus for pulling tube ends open to form base squares of cross-bottom sacks. 4,493,686, Cl. 493-256.000.

Ederer Incorporated: *See—*
Clark, Charles W., 4,493,479, Cl. 254-274.000.

Edgerley, Peter G.; and Oldland, Sidney R. D., to Imperial Chemical Industries PLC. Resilient polyurethane foam with improved resistance to ignition. 4,493,871, Cl. 428-308.400.

Edwards, Clifton V., II, to Lundell Laboratories, Inc. Heart pump. 4,493,314, Cl. 128-1.00D.

EG&G, Inc.: *See—*
Goldberg, Seymour, 4,494,085, Cl. 331-94.100.

Ehrenbard, Christine H.; and Gottfried, Noah L., to AT&T Bell Laboratories. Timing recovery in a baud-rate sampled-data system. 4,494,242, Cl. 375-118.000.

Ehrfeld, Wolfgang: *See—*
Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, 4,493,753, Cl. 204-9.000.

Eisai Co., Ltd.: *See—*
Sugimoto, Hachiro; Hamano, Sachiyuki; Shoji, Tadao; Kaneko, Takeru; and Uzuo, Takeshi, 4,493,837, Cl. 424-253.000.

Ekman, Heinz, to Verdal Maskinverksted A/S. Means for recovering heat from a room space, and for ventilation. 4,493,366, Cl. 165-54.000.

Eldridge, Arthur C.: *See—*
Friedrich, John P.; and Eldridge, Arthur C., 4,493,854, Cl. 426-629.000.

Electric Power Research Institute, Inc.: *See—*
Graf, Walter A., Jr., 4,493,792, Cl. 252-627.000.
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,493,379, Cl. 175-57.000.

Electricite de France: *See—*
Bailleux, Christian; Bernard, Michel; Dupont, Bernard; Lozach, Guy; and Mata, Jean-Pierre, 4,493,917, Cl. 524-394.000.

Electronique Marcel Dassault: *See—*
Mayoux, Jean-Jacques, 4,494,241, Cl. 375-76.000.

Elf France: *See—*
Bernard, Jean R.; and Breysse, Michele, 4,493,901, Cl. 502-37.000.

Eli Lilly and Company: *See—*
Zimmerman, Ronald E.; Burck, Philip J.; Jones, C. David; and Thakkar, Arvind L., 4,493,699, Cl. 604-55.000.

Eliscu, Steven M.: *See—*
Bernard, Francis S.; Eliscu, Steven M.; and Batterman, Eric P., 4,494,214, Cl. 364-724.000.

Elliott, Richard E. Floating boat dock anchor. 4,493,283, Cl. 114-263.000.

Elmis, Herbert, to ITT Industries, Inc. Frequency divider presettable to fractional divisors. 4,494,243, Cl. 377-48.000.

Emerson Electric Co.: *See—*
Mitchell, Albert W., 4,493,151, Cl. 30-276.000.
Stahlhut, Leo G., 4,493,171, Cl. 52-28.000.

Empak Inc.: *See—*
Johnson, Douglas M., 4,493,418, Cl. 206-454.000.

Emsperger, Werner; and Engelhardt, Reiner, to Kraftwerk Union Aktiengesellschaft. Steam power plant and steam generator, especially suited for a steam power plant of this type. 4,493,186, Cl. 60-39.182.

Endo, Katsusuke; Kato, Eiichi; Ohki, Nobutaka; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,493,888, Cl. 430-405.000.

Endo, Keiji: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,493,943, Cl. 174-25.00C.

Endo, Yorimasa: *See—*
Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, 4,493,811, Cl. 376-254.000.

Enertec: *See—*
Ley, Antony; Allesch, Roland; and Bazin, Alain, 4,494,068, Cl. 324-126.000.

Engel, Hinrich, to Vereinigte Flugtechnische Werke GmbH. Rapid action clamping for cooperation with slot tracks. 4,493,470, Cl. 248-503.100.

Engelhard Corporation: *See—*
Brown, Stanley M.; Durante, Vincent A.; Reagan, William J.; and Speronello, Barry K., 4,493,902, Cl. 502-65.000.

Engelhardt, Reiner: *See—*
Emsperger, Werner; and Engelhardt, Reiner, 4,493,186, Cl. 60-39.182.

Engler, Rolf; and Wulf, Rudolf, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Process and apparatus for measuring travel time differences of ultrasonic pulses for the determination of flow fields. 4,493,217, Cl. 73-861.270.

Enlow, Norman K.: *See—*
Dydyk, Michael; Enlow, Norman K.; and Tuzzolino, Joseph R., 4,494,087, Cl. 331-107.0DP.

Epstein, Saul. Clinical instrument for measuring pulse rate and body temperature. 4,493,564, Cl. 374-179.000.

Ernsthausen, Roger E.: *See—*
Wedding, Donald K.; Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard J., 4,494,038, Cl. 313-587.000.

Esken, Robert L., to Bendix Corporation, The. Measuring apparatus and method of making. 4,493,153, Cl. 33-149.00J.

Espe Fabrik pharmazeutischer Praparate, GmbH: *See—*
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,493,911, Cl. 523-109.000.

Essex Group, Inc.: *See—*
Ditton, Louis G., 4,493,462, Cl. 242-118.610.

Estabrooks, David A. Dot matrix printhead employing moving coils. 4,493,568, Cl. 400-124.000.

Eszakmagyarorszagi Vegyimuvek: *See—*
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.

Euclid Spiral Paper Tube Corp.: *See—*
Buckner, Leonard; Foll, William A., Sr.; and Pesho, Stephen W., 4,493,178, Cl. 53-131.000.

Euvrard, Hubert: *See—*
Lacour, Bernard; Euvrard, Hubert; Gaillard, Roger; and Boinot, Jean C., 4,493,646, Cl. 433-133.000.

Evason, John, to Pilkington Brothers P.L.C. Method of and apparatus for thermally toughening glass. 4,493,723, Cl. 65-114.000.

Ex-Cell-O Corporation: *See—*
Moore, James I.; and Van Huis, Philip J., 4,493,362, Cl. 164-457.000.

Exploration Logging, Inc.: *See—*
Jeter, John D.; and More, Henry S., 4,494,072, Cl. 324-347.000.

Exxon Production Research Co.: *See—*
Bragg, James R., 4,493,774, Cl. 252-8.55D.
Ortloff, John E., 4,493,282, Cl. 114-230.000.

Exxon Research and Engineering Co.: *See—*
Long, Robert B.; and Caruso, Fred A., 4,493,765, Cl. 208-309.000.
Rhodes, Richard P.; and Hershkowitz, Frank, 4,493,763, Cl. 208-11.00R.
Sheng, Ping; and Stepleman, Robert S., 4,493,942, Cl. 136-259.000.

Eyer, Jean, to Hotchkiss-Brandt-Sogeme-H.B.S. Device for guiding and receiving letters at the exit of a mail-sorting machine and a machine equipped with said device. 4,493,484, Cl. 271-220.000.

Eyler, Francis R., to Harsco Corporation. Starter thermal overload protection system. 4,494,162, Cl. 361-29.000.

F. F. Seeley Nominees Pty. Ltd.: *See—*
Bound, Damon J. F., 4,493,953, Cl. 200-6.00B.

F. LLI Marzoli & C. S.p.A.: *See—*
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Faizullabhoy, Mustansir A.: *See—*
Chitayat, Anwar; Goldstein, Robert C.; and Faizullabhoy, Mustansir A., 4,494,060, Cl. 318-568.000.

Falb, Wolfgang: *See—*
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Fankhauser, Hanspeter: *See—*
Weil, Wolfgang; Lanz, Andres; Vogt, Max; Meier, Paul; Kaul, Martin; and Fankhauser, Hanspeter, 4,493,962, Cl. 219-64.000.

Farber, Heinrich: *See—*
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Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.

Farmer's Factory Co.: *See—*
Glendenning, George B.; and Glendenning, Terry S., 4,493,181, Cl. 56-314.000.

Farrow, Robin F. C.: *See—*
Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., 4,494,133, Cl. 357-30.000.

Fastner, Thorwald; Mayrhofer, Max; and Taschner, Walter, to Voest-Alpine Aktiengesellschaft. Method of producing a plate of steel. 4,493,452, Cl. 228-158.000.

Fauveau, Patrick: *See—*
Nedelec, Lucien; Pierdet, Andre ; and Fauveau, Patrick, 4,493,836, Cl. 424-248.400.

Feagin, John A., Jr. Ski pole handle. 4,493,494, Cl. 280-821.000.
Fein, Michael E.: *See*—
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Feldman, Rubin, to Thermal Science, Inc. Thermal protective system. 4,493,945, Cl. 174-68.00C.
Fell, Peter J.: *See*—
Clark, Stephen D.; Wood, Philip S.; and Fell, Peter J., 4,493,451, Cl. 228-119.000.
Fenne, Ivor, to Lucas Industries public limited company. Fuel injection pumping apparatus. 4,493,621, Cl. 417-462.000.
Fenton, Garry: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, 4,493,843, Cl. 424-274.000.
Ferix Corporation: *See*—
Springer, Gilbert D., 4,494,125, Cl. 346-74.500.
Fernwood, George G.; and Burd, Samuel, to Bio-Rad Laboratories, Inc. Supporting and filtering biochemical test plate assembly. 4,493,815, Cl. 422-101.000.
Ferrari, Antonio. System for creating dams with mobile and/or partially mobile water-retaining elements. 4,493,587, Cl. 405-114.000.
Ferrigni, Donato. Interchangeable tiles puzzle. 4,493,487, Cl. 273-153.00S.
Ferroplast Gesellschaft fur Metall- und Kunststoffepzeucnisse mbH: *See*—
Schlimbach, Heinrich, 4,493,593, Cl. 406-146.000.
Fertl, Walter H., to Dresser Industries, Inc. Determination of water saturation in earth formations independent of lithology. 4,494,071, Cl. 324-338.000.
Fiat Auto S.p.A.: *See*—
Pagano, Roberto; and Nannini, Alessandro, 4,493,390, Cl. 181-204.000.
Fichtel & Sachs AG: *See*—
Anders, Peter; and Schierling, Bernhard, 4,493,673, Cl. 464-66.000.
Fickert, Werner: *See*—
Orth, Winfried; and Fickert, Werner, 4,493,935, Cl. 548-562.000.
Fickler, Hans. Linear drive device with two motors. 4,494,025, Cl. 310-80.000.
Field, Edgar L., Jr., to Coburn Optical Industries, Inc. Calibration gauge for computer-controlled lens generator, or the like. 4,493,168, Cl. 51-165.870.
Figgie International Inc.: *See*—
Karlsen, Stig, 4,493,394, Cl. 182-179.000.
Fine, Richard A.; and Nason, George F., III. Illumination means for 3-D printing apparatus. 4,493,551, Cl. 355-22.000.
Fink, Thomas F., Jr.: *See*—
Sands, Robert W.; Marella, Joseph P.; and Fink, Thomas F., Jr., 4,494,176, Cl. 362-297.000.
Fioravanti, Mario. Method of treating and conserving filled dough food products. 4,493,850, Cl. 426-283.000.
Firestone Tire & Rubber Company, The: *See*—
Dieckmann, J. Robert; Lauber, Michael L.; and Roodvoets, Mark R., 4,493,631, Cl. 425-292.000.
Firestone, William L.: *See*—
Lovick, Richard B.; and Firestone, William L., 4,494,143, Cl. 358-122.000.
Fischer, Albert J., to William Prym Werke KG. Sewing-machine attachment. 4,493,275, Cl. 112-105.000.
Fischer, Hermann, to M.A.N.—Roland Druckmaschinen Aktiengesellschaft. Multi-station sheet rotary offset printing machine. 4,493,255, Cl. 101-183.000.
Fisher, John L.; and Curtis, Joe E., Jr., to Kuhlman Corporation. Transformer core and method and apparatus for forming same. 4,494,102, Cl. 336-212.000.
Fisher, Ralph H., to Lake, Rutherford C., Jr.; and Duberg, John E., part interest to each. Reversible cycle heating and cooling system. 4,493,193, Cl. 62-160.000.
Fisk, Thomas E., to Dow Chemical Company, The. Stable dispersions of polymers in polyfunctional compounds having a plurality of active hydrogens. 4,493,908, Cl. 521-137.000.
Fiumefreddo, John: *See*—
Leong, Henry; and Fiumefreddo, John, 4,493,523, Cl. 339-105.000.
Flannery, Lincoln R.: *See*—
Maier, Bruce R.; and Flannery, Lincoln R., 4,493,115, Cl. 2-2.000.
Flaschel, Erwin; and Renken, Albert, to Sulzer Brothers Limited. Device and method for forming a fluidized bed. 4,493,735, Cl. 134-25.100.
Flatt, Thomas R., to Mobay Chemical Corporation. Conditioning of crude pigment in a salt free corn syrup based medium. 4,493,734, Cl. 106-309.000.
Fleisher, Martin, to Memorial Hospital for Cancer & Allied Diseases. Solvent system for peroxidase inhibitor reagent for fecal occult blood determinations. 4,493,892, Cl. 435-28.000.
Florkey's Conveyor Service, Inc.: *See*—
Hoffmann, Frank F., 4,493,680, Cl. 474-230.000.
FMC Corporation: *See*—
Plummer, Ernest L., 4,493,844, Cl. 424-275.000.
Fogarty, Thomas J.: *See*—
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Foley, John T.: *See*—
Bilstad, Arnold C.; Foley, John T.; and Woodworth, Walker P., 4,493,693, Cl. 604-6.000.
Foll, William A., Sr.: *See*—
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Ford Motor Company: *See*—
Asik, Joseph R., 4,493,306, Cl. 123-620.000.
Chattha, Mohinder S., 4,493,914, Cl. 523-436.000.
Lake, W. H. R.; and Grandinett, D. H., 4,493,387, Cl. 180-248.000.
Meyer, Fred J.; and Newman, Seymour, 4,493,918, Cl. 524-451.000.
Forde, Louis. Apparatus for giving engines positive effect. 4,493,299, Cl. 123-185.00S.
Forsvarets Forskningsanstalt: *See*—
Sanden, Roland, 4,493,916, Cl. 524-217.000.
Fortgens, Walter, to AB Volvo. Jack. 4,493,478, Cl. 254-126.000.
Fory, Werner: *See*—
Burdeska, Kurt; Kabas, Guglielmo, deceased; Brunner, Hans-Georg; and Fory, Werner, 4,493,726, Cl. 71-87.000.
Foster, John S., to United States of America, Navy. Annular shaped charge for breaching masonary walls. 4,493,260, Cl. 102-307.000.
Foster Wheeler Energy Corporation: *See*—
Johnson, Richard C.; and Norris, Allyn P., 4,493,206, Cl. 73-7.000.
Foulke, Richard F.; and Lord, Steven M., to Proconics International, Inc. Wafer transfer apparatus. 4,493,606, Cl. 414-787.000.
Frampton, John C.: *See*—
Kubert, Vincent T.; Frampton, John C.; and Ono, George Y., 4,493,257, Cl. 101-349.000.
Francis, Alex W., Jr., to Combustion Engineering, Inc. Floatable offshore production structure and method for fabrication, transport and installation of same. 4,493,591, Cl. 405-198.000.
Francois, Daniel: *See*—
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Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.
Franklin Electric Co., Inc.: *See*—
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Franks, William S., Jr.: *See*—
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Fraser, Kenneth D.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.
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Fraunhofer-Gesellschaft Zur Forderung der angewandten Forschung e.V.: *See*—
Muller, Dietmar; Schubert, Hiltmar; and Krohnert, Rudolf, 4,493,630, Cl. 425-203.000.
Fredriksson, Hasse; and Tiberg, Lars, to Jernkontoret. Method at continuous casting of steels and metal alloys with segregation tendency and apparatus for carrying out the method. 4,493,363, Cl. 164-476.000.
Freeman, Gerald L.: *See*—
Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuske, Stanley, 4,494,003, Cl. 250-474.100.
Freeman, Kenneth A.: *See*—
Townson, Jimmy D., 4,493,380, Cl. 175-61.000.
Freidinger, Roger M.: *See*—
Veber, Daniel F.; and Freidinger, Roger M., 4,493,934, Cl. 548-550.000.
Freyberger, Laurin C.; and Novotny, Bernd, to ITT Industries, Inc. Integrated interface circuit between the RGB matrix and the video output stages of color-television sets. 4,494,137, Cl. 358-27.000.
Fridman, Jacob: *See*—
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Friedrich, John P.; and Eldridge, Arthur C., to United States of America, Agriculture. Production of defatted soybean products by supercritical fluid extraction. 4,493,854, Cl. 426-629.000.
Friedrich Munch GmbH & Co. K.G.: *See*—
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,493,865, Cl. 428-52.000.
Frieling, Focko; Michael, Ewald; and Nikutta, Wolfgang, to Siemens Aktiengesellschaft. Pulse enhancement circuit for digital integrated circuit. 4,494,015, Cl. 307-268.000.
Fries, Herbert; Gerstenmaier, Jurgen; Kircher, Stefan; and Koch-Ducker, Jurgen, to Robert Bosch GmbH. Anti-block control system test. 4,493,210, Cl. 73-121.000.
Frioux, Christian: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,493,598, Cl. 414-1.000.
Fuchs, Hugo: *See*—
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Fuji Electric Co., Ltd.: *See*—
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Abe, Kunihiro, 4,493,301, Cl. 123-339.000.

Takano, Toshio; and Mura, Shinichiro, 4,493,403, Cl. 192-4.00A.
Yamakawa, Toru, 4,493,190, Cl. 60-714.000.
Fuji Photo Film Co., Ltd.: *See—*
Endo, Katsusuke; Kato, Eiichi; Ohki, Nobutaka; and Ishikawa, Takatoshi, 4,493,888, Cl. 430-405.000.
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Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,493,889, Cl. 430-572.000.
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Ohmura, Hiroshi; Kohno, Atsuo; Shiiba, Minoru; and Tanaka, Tsutomu, 4,493,542, Cl. 354-82.000.
Fuji Xerox Co., Ltd.: *See—*
Kurata, Masami; and Ohmori, Takashi, 4,494,152, Cl. 358-293.000.
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Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Muting apparatus. 4,494,158, Cl. 360-69.000.
Fujie, Akira; and Hisamatsu, Minoru, to Dow Chemical Company, The. Foamable electroconductive polyolefin resin compositions. 4,493,788, Cl. 252-511.000.
Fujinaga, Yasuhiro: *See—*
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Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,493,833, Cl. 424-246.000.
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,493,834, Cl. 424-246.000.
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,493,832, Cl. 424-199.000.
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Fujitsu Fanuc Limited: *See—*
Imazeki, Ryoji; and Kusumi, Katsuaki, 4,494,206, Cl. 364-474.000.
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Honda, Norio, 4,493,145, Cl. 29-840.000.
Koike, Takashi; and Sugiura, Hajime, 4,494,215, Cl. 364-900.000.
Fujiwara, Koichi; Sakai, Tomohiko; Yamada, Yoneo; and Higashine, Kazutaka, to Nippon Steel Corporation. Process for producing a grain-oriented electromagnetic steel sheet or strip having a low watt loss and a grain-oriented electromagnetic steel strip having uniform magnetic properties. 4,493,739, Cl. 148-111.000.
Fukaya, Hirokazu; and Niki, Haruo, to Nippon Electric Co., Ltd. Amplifier system switchable between two amplifying operations. 4,494,077, Cl. 330-295.000.
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Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, to Citizen Watch Co., Ltd. Acoustic alarm device for watches. 4,493,560, Cl. 368-88.000.
Fuller, Charles C.; and Hendrickson, James L., to Safe-Base, Inc. Ball base construction and anchor. 4,493,486, Cl. 273-25.000.
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Funakoshi, Tadayoshi; and Takeda, Kazuo, to Hitachi, Ltd. Horizontally split casing of turbo machine. 4,493,611, Cl. 415-199.100.
Funderburk, F. Gene; Culbertson, E. C.; and Posey, Robert G., to American Hoechst Corporation. Polyester film coated with metal adhesion promoting copolyester. 4,493,872, Cl. 428-332.000.
Furukawa, Noboru, to Ricoh Company, Ltd. Facsimile communication data recording apparatus for facsimile transceiver. 4,494,149, Cl. 358-257.000.
Furutaka, Yasuhisa; and Ishii, Sadamu, to Daikin Kogyo Co., Ltd. Process for preparing trifluoromethylbenzene derivatives. 4,493,800, Cl. 260-465.00D.
Furuzawa, Kunihiko; Funaki, Yuji; Hisada, Yoshio; and Izumi, Kazuo, to Sumitomo Chemical Company, Limited. Fungicidal N-(phenyl-lower alkanoyl-)-imidazole derivatives, composition, and method of use. 4,493,842, Cl. 424-273.00R.
Fuzzell, Joe E., to Caterpillar Tractor Co. Latching solenoid. 4,494,096, Cl. 335-170.000.
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Galahad, Giles, to Chaldar, Inc. Neck-strain alleviator for bicyclists. 4,493,225, Cl. 74-551.300.
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Piepers, Harry C., 4,493,757, Cl. 204-206.000.
Gallois, Philippe; and Christidis, Yani, to Societe Francaise Hoechst. 2-Dimethylamino-2-parahydroxyphenyl sodium acetate, preparation process and application thereof to production of parahydroxybenzyl cyanide. 4,493,937, Cl. 562-444.000.
Gamroth, Arthur P. Heating unit. 4,493,270, Cl. 110-188.000.
Ganek, Jerome S.; and Ganek, Lee G., to Ciracco Metal Fabricating Co., Inc. Snap-fit sheet metal cover for portable oil-filled radiators and method of manufacture. 4,493,974, Cl. 219-341.000.
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Ganter, Robert; Whitmoyer, Robert; and Rye, Palle, to Thermics Corporation Liquidating Trust. Fossil fuel catalyst generator. 4,493,637, Cl. 431-190.000.
Garay, Oscar M., to Motorola, Inc. Two element low profile antenna. 4,494,120, Cl. 343-702.000.
Garay, Oscar M.; and Balzano, Quirino, to Motorola, Inc. Antenna apparatus capable of resonating at two different frequencies. 4,494,122, Cl. 343-722.000.
Garcia, Carlos M.; Reed, I. Ely; and McLeod, Dale K. Pipe cutter with split ring frame and enclosed feeding means. 4,493,150, Cl. 30-97.000.
Gardinier, Inc.: *See—*
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Garrett Corporation, The: *See—*
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Gast, Theodor; Binder, Kurt; and Honig, Gunter, to Robert Bosch GmbH. Vibrator damping flow meter. 4,493,215, Cl. 73-861.180.
Gaston, Everett E., to Gaston Manufacturing, Inc. Wind machine. 4,494,007, Cl. 290-44.000.
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Gauchet, Yves M. A.; and Paillaud, Pierre G., to Nodet-Gougis. Planting assembly. 4,493,273, Cl. 111-86.000.
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Gauthier, Francis; and Gombert, Jean, to Thomson-CSF. Process for producing doped vitreous silica for preparing a preform for an optical fibre. 4,493,720, Cl. 65-3.120.
Gawad, Mahmoud A.; and Graudins, John, to GTE Products Corporation. Recessed lighting fixture with improved louver mounting. 4,494,175, Cl. 362-150.000.
Geberit A.G.: *See—*
Keller, Hans, 4,493,985, Cl. 219-535.000.
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Geller, David A., to Wico Corporation. Adapter circuit for trackball device. 4,493,992, Cl. 250-221.000.
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Augustine, Paul C., Jr., 4,493,266, Cl. 105-255.000.
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Yueh, William R., 4,494,202, Cl. 364-462.000.
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Altekruse, Richard A., 4,494,141, Cl. 358-111.000.
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Chang, Hsiao-Nan L., 4,494,208, Cl. 364-494.000.
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Otto, Charles W., 4,494,027, Cl. 310-89.000.
Paul, Duane B., 4,493,608, Cl. 415-11.000.
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Suster, Mary E., 4,493,639, Cl. 431-359.000.
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Gholson, Norman H., to United States of America, Navy. Controller for a locked carrier distributed multiplexed telemetry system. 4,494,115, Cl. 340-825.650.
Gibbard, David W., to Dataface Limited. Milk yield recording and concentrate feed ration calculation for dairy cows. 4,493,290, Cl. 119-51.00R.
Gibbs, Richard D.; and Johnson, Roger C., to Westinghouse Electric Corp. Vapor cooled electrical inductive apparatus. 4,493,138, Cl. 29-33.00Q.
Giebelhausen, Charles W.; and Davila, Jose E., to General Signal Corporation. Cash collection receptacle. 4,493,454, Cl. 232-15.000.
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Gilmore Valve Company: *See*—
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Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, to La Calhene; and Commissariat a l'Energie Atomique. Master-slave type telescopic telemanipulator. 4,493,598, Cl. 414-1.000.
Gladd Industries, Inc.: *See*—
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Glass, Howard L., to Rockwell International Corporation. Ceramic strontium ferrite borate. 4,493,819, Cl. 423-277.000.
Glass, Michael: *See*—
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Glendenning, George B.; and Glendenning, Terry S., to Farmer's Factory Co. Attachment for the snouts of combines and the like. 4,493,181, Cl. 56-314.000.
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Godfrey, Noel R.; Parkes, Larry S.; and Treacy, Richard H., to Broken Hill Proprietary Company Limited, The. System for supression of underdamped oscillations in ac power drawn by synchronous motors driving Ward-Leonard generators. 4,494,050, Cl. 318-158.000.
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Goel, Prabhakar; and McMahon, Maurice T., to International Business Machines Corporation. Method of electrically testing a packaging structure having n interconnected integrated circuit chips. 4,494,066, Cl. 324-73.00R.
Goetschi, Fred A. Apparatus for photographically producing characters or other representations. 4,493,541, Cl. 354-5.000.
Goffe, Randal A., to Monsanto Company. Modular spinnerette assembly. 4,493,629, Cl. 425-192.00S.
Golda, Horst: *See*—
Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, 4,493,234, Cl. 83-175.000.
Goldberg, Seymour, to EG&G, Inc. Miniaturized atomic frequency standard having both filter cell and absorption cell in resonator cavity. 4,494,085, Cl. 331-94.100.
Goldstein, Robert C.: *See*—
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Gontowski, Walter S., Jr.; and Rollins, George E., to Sprague Electric Company. Oscillator with capacitor charged and discharged by current proportional to a reference current. 4,494,088, Cl. 331-111.000.
Goodin, Richard D.; and Chupp, John P., to Monsanto Company. Electrolytic preparation of orthoalkyl-2-halo-N-acylanilides. 4,493,755, Cl. 204-73.00R.
Gordon, Lucas S.; and Pierson, Jeanne, to Bentley Laboratories, Inc. Blood reservoir. 4,493,705, Cl. 604-122.000.
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Goss, Gary J.; Kelly, Richard P.; and Murray, Thomas L., Jr., to Honeywell Information Systems Inc. Automatic data steering and data formatting mechanism. 4,494,186, Cl. 364-200.000.
Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Winding voltage balancing circuit for brushless DC motor. 4,494,053, Cl. 318-254.000.
Gottfried, Noah L.: *See*—
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Graham, Larry W.: *See*—
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Grass, Alfred. Door hinge for lateral and heighth adjustment. 4,493,129, Cl. 16-238.000.
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Green, Richard. Trash and garbage compactor. 4,493,251, Cl. 100-53.000.
Green, William A.; Godfrey, Joe E.; and Pietsch, David S., to Owens-Corning Fiberglas Corporation. Packaged strand. 4,493,464, Cl. 242-170.000.
Greene, Roger E.: *See*—
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Greer, Michael T., to Wang Laboratories, Inc. Controller for peripheral data storage units. 4,494,196, Cl. 364-200.000.
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Gretchev, Vladimir, to Delphax Systems. Electrostatic printing apparatus. 4,494,129, Cl. 346-154.000.
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Grinn, James M.: *See*—
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Groff, James W. Radio-controlled teaching device. 4,493,655, Cl. 434-351.000.

Gronnerud, Rolf; and Boe, Einar, to Norsk Hydro a.s. Helical flow heat exchanger having individually adjustable baffles. 4,493,368, Cl. 165-159.000.

Gross, James R., to Dow Chemical Company, The. Phosgene removal process. 4,493,818, Cl. 423-240.000.

Grossman, Stanley J. Composite, pre-stressed structural member and method of forming same. 4,493,177, Cl. 52-745.000.

Groth, Edward J., Jr., to Motorola, Inc. Multiple channel data link system. 4,494,238, Cl. 375-1.000.

Groutage, Frederick D.; Conjerti, Samuel N.; and Shaw, Lockburn S., to United States of America, Navy. Pivotal mono wing cruise missile with wing deployment and fastener mechanism. 4,493,136, Cl. 24-573.000.

Grover, Donald D., to Snap-on Tools Corporation. Dual engine probe. 4,493,208, Cl. 73-117.300.

Gruber, Robert J.; Agostine, Doretta; Julien, Paul C.; and Yourd, Raymond A., III, to Xerox Corporation. Electrophotographic toner compositions containing novel imide charge control additives. 4,493,883, Cl. 430-110.000.

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Grunsky, Manfred; Sussmuth, Reiner; Dehn, Dieter; and Ischen, Gunter, to Stellram S.A. Rotary material removing tool. 4,493,596, Cl. 408-233.000.

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GTE Communications Systems Corporation: *See*—
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GTE Government Systems Corporation: *See*—
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GTE Laboratories Incorporated: *See*—
Budinger, A. Bowman; Byszewski, Wojciech W.; and Proud, Joseph M., 4,494,046, Cl. 315-260.000.

GTE Products Corporation: *See*—
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Roche, William J., 4,494,042, Cl. 315-56.000.
Snell, Richard G.; and Loughridge, Fredrick A., 4,493,944, Cl. 174-50.640.

Gualtieri, John G.; and Vig, John R., to United States of America, Army. Techniques for locating beams within large area detectors. 4,493,991, Cl. 250-203.00R.

Guch, Steve, Jr.; Gardner, Phillip J.; Braverman, Leonard W.; and Jones, Robert W., to GTE Government Systems Corporation. Multiple wavelength laser. 4,494,235, Cl. 372-23.000.

Guequierre, Denis D.: *See*—
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,493,717, Cl. 55-330.000.

Gulf Research & Development Company: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,493,905, Cl. 502-325.000.

Gum, Peter H.: *See*—
Bean, George H.; and Gum, Peter H., 4,494,189, Cl. 364-200.000.

Gunderson, Robert O.; Kocol, James C.; and Schuck, David B., to NCR Corporation. Data processing system employing broadcast packet switching. 4,494,185, Cl. 364-200.000.

Guntert, Ronald M., to Guntert & Zimmerman Const. Div., Inc. Apparatus and process for dowel insertions. 4,493,584, Cl. 404-74.000.

Guntert & Zimmerman Const. Div., Inc.: *See*—
Guntert, Ronald M., 4,493,584, Cl. 404-74.000.

Gunther, Klaus; Hornung, Friedrich; Paule, Kurt; and Schadlich, Fritz, to Robert Bosch GmbH. Electronic two-hand safety system for power tools. 4,493,377, Cl. 173-170.000.

Gus Pech Manufacturing Co.: *See*—
Collins, Robert A.; and Lewis, Timothy A., 4,493,382, Cl. 175-206.000.

Gutleber, Frank S., to United States of America, Army. Orthogonal code division multiple access communications systems. 4,494,228, Cl. 370-18.000.

Haag, Donald L.: *See*—
Woods, Lee O.; and Haag, Donald L., 4,493,144, Cl. 29-622.000.

Haas, Peter; and Hettel, Hans, to Bayer Aktiengesellschaft. Poly-N,N-hydroxyalkylamides of polybasic carboxylic acids and a process for the production thereof. 4,493,909, Cl. 521-166.000.

Haga, Takahiro: *See*—
Kimura, Fumio; and Haga, Takahiro, 4,493,730, Cl. 71-94.000.

Hageniers, Omer L.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,493,554, Cl. 356-241.000.

Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuske, Stanley, to United States of America, Army. Method of detecting gamma radiation by placing glass doped with iron in an environment subject to gamma radiation and then measuring any color changed in the doped glass as a function of gamma radiation. 4,494,003, Cl. 250-474.100.

Halberschmidt, Friedrich: *See*—
Schwarzenberg, Norbert; Ueberwolf, Heinz; Halberschmidt, Friedrich; and Audi, Joseph, 4,493,724, Cl. 65-273.000.

Haldipur, Gaurang B.; Anderson, Richard G.; and Cherish, Peter, to United States of America, Energy. Gasification system. 4,493,636, Cl. 431-170.000.

Hale, Donnie E.: *See*—
McMahon, Ronald G.; and Hale, Donnie E., 4,493,566, Cl. 400-59.000.

Hall, Homer H.: *See*—
Carter, Daniel L.; and Hall, Homer H., 4,493,986, Cl. 219-85.00D.

Hall, Lawrence A.; Lightner, Linn S.; Long, William B.; Shannon, Suel G.; and Stahl, Daniel E., to AMP Incorporated. Electrical plug connector and receptacle therefor. 4,493,525, Cl. 339-143.00R.

Halliburton Company: *See*—
Knox, Lloyd C., 4,493,592, Cl. 405-225.000.
Smith, Harry D., Jr.; Arnold, Dan M.; and Schultz, Ward E., 4,493,998, Cl. 250-252.100.

Hamano, Sachiyuki: *See*—
Sugimoto, Hachiro; Hamano, Sachiyuki; Shoji, Tadao; Kaneko, Takeru; and Uzuo, Takeshi, 4,493,837, Cl. 424-253.000.

Hamilton, Lawrence E.; and Rutili, Renzo N., to Stewart-Warner Corporation. Illuminated membrane switch. 4,493,958, Cl. 200-314.000.

Hampson, Alfred A.; Hutchins, Thomas B., deceased; and by Hutchins, Nancy K., executrix. Container end-code redemption scanning. 4,493,989, Cl. 235-464.000.

Haneda, Hideo; and Yamanaka, Minoru, to Aisin Seiki Kabushiki Kaisha. Solenoid device. 4,494,098, Cl. 335-230.000.

Hanger, Randolph T., to Boeing Company, The. Abrading tool. 4,493,170, Cl. 51-330.000.

Hanke, Hans: *See*—
Paul, Jurgen; Braatz, Andreas; and Hanke, Hans, 4,493,293, Cl. 123-41.120.

Hansen, Kenneth P., to United Technologies Corporation. Fuel control. 4,493,187, Cl. 60-39.281.

Hanson, Harold W., Jr., to Par-Way Manufacturing Co. Variable rate food ingredient delivery apparatus. 4,493,442, Cl. 222-241.000.

Hanson, Jay L., to Thermo King Corporation. Transport refrigeration system with control for top freezing avoidance. 4,493,191, Cl. 62-126.000.

Hanson, Lester A., to Blu-Surf, Inc. Solvent reducing oven. 4,493,640, Cl. 432-72.000.

Hara, Teruya: *See*—
Ina, Kenzo; and Hara, Teruya, 4,494,157, Cl. 360-48.000.

Harada, Norimichi: *See*—
Inoue, Seiji; and Harada, Norimichi, 4,493,656, Cl. 440-2.000.

Hardee, Kim C.; and Sud, Rahul, to Inmos Corporation. Bit line precharging and equilibrating circuit. 4,494,221, Cl. 365-203.000.

Hargreaves, Rodney B.; and McLoughlin, Bernard J., to Imperial Chemical Industries PLC. 1,3,4-Thiadiazines. 4,493,835, Cl. 424-246.000.

Harkness, John C., to Sperry Corporation. Direct current inrush limiting circuit. 4,494,064, Cl. 323-277.000.

Harrell, John C. Bucket conveyor assembly. 4,493,413, Cl. 198-708.000.

Harri, Kurt, to Gebruder Zehnder A.G. Circuit assembly for charging an accumulation battery with pulsating direct current. 4,494,062, Cl. 320-40.000.

Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., to Burroughs Corporation. Line support processor for data transfer system. 4,494,194, Cl. 364-200.000.

Harris Graphics Corporation: *See*—
Kubert, Vincent T.; Frampton, John C.; and Ono, George Y., 4,493,257, Cl. 101-349.000.

Harris, Robert B.: *See*—
Chapman, Francis E.; and Harris, Robert B., 4,493,781, Cl. 252-88.000.

Harrison, James S. Preservative and fixative preparations for biological systems. 4,493,821, Cl. 424-3.000.

Harsco Corporation: *See*—
D'Alessio, Michael S., 4,493,578, Cl. 403-49.000.
Eyler, Francis R., 4,494,162, Cl. 361-29.000.

Harting, Stanley C.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.

Hartlaub, Jerome T.; and Beckmann, Paul J., to Medtronic, Inc. Tachyarrhythmia pacer. 4,493,325, Cl. 128-419.0PG.

Hartley, E. Dale, to Product Research And Development. Liquid dispensing system and automatic selector therefor. 4,493,435, Cl. 222-52.000.

Hartness, Thomas P.: *See*—
Hartness, Thomas S.; and Hartness, Thomas P., 4,493,599, Cl. 414-120.000.

Hartness, Thomas S.; and Hartness, Thomas P. Article depalletizer. 4,493,599, Cl. 414-120.000.

Hasegawa, Shumpei, to Honda Motor Co., Ltd. Method of controlling the fuel supply to an internal combustion engine at deceleration. 4,493,300, Cl. 123-325.000.

Hashimoto, Eiichi: *See*—
Ueda, Fumio; Hashimoto, Eiichi; Yamada, Takeyoshi; and Mori, Koh, 4,493,714, Cl. 55-16.000.

Hashimoto, Masanori; and Ogawa, Shunichi, to Ricoh Company, Ltd. Printing apparatus. 4,493,573, Cl. 400-647.100.

Hashimoto, Masashi: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.

Hassler, Dieter, to Siemens Aktiengesellschaft. Method and apparatus for conducting flow measurements on flowing media according to the ultrasonic doppler method. 4,493,216, Cl. 73-861.250.

Hatanaka, Hideo: *See—*
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,493,560, Cl. 368-88.000.

Hatanaka, Hiroshi: *See—*
Shimamoto, Kunihiro; Hatanaka, Hiroshi; Seki, Shinichiro; and Orita, Ryozo, 4,493,938, Cl. 568-62.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic torque converter for vehicles. 4,493,402, Cl. 192-326.000.

Hattori, Yoshiyuki: *See—*
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.

Hatzikelis, Christopher; Madonia, Ciro; and Cosentino, Cesare C. Recycling of contaminated plastic. 4,493,806, Cl. 264-28.000.

Haug, Werner: *See—*
Clemen, Rainer; and Haug, Werner, 4,494,018, Cl. 307-482.000.

Hauser, Stephen G.: *See—*
von Buelow, John; and Hauser, Stephen G., 4,493,440, Cl. 222-109.000.

Hausermann Abrading Process Company: *See—*
Hausermann, Marten C.; and Hausermann, Elmer P., 4,493,165, Cl. 51-58.000.

Hausermann, Elmer P.: *See—*
Hausermann, Marten C.; and Hausermann, Elmer P., 4,493,165, Cl. 51-58.000.

Hausermann, Marten C.; and Hausermann, Elmer P., to Hausermann Abrading Process Company. Orbital polisher with elastic abrasive. 4,493,165, Cl. 51-58.000.

Havens, James R.: *See—*
Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., 4,493,965, Cl. 219-109.000.

Hayashi, Keizo: *See—*
Hori, Yoshimi; Ishida, Takashi; and Hayashi, Keizo, 4,493,632, Cl. 425-393.000.

Hayashi, Shozo: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,493,943, Cl. 174-25.00C.

Hayes, Alan C.: *See—*
Becker, Donald E.; Hayes, Alan C.; and Porter, Joseph W., 4,493,816, Cl. 422-143.000.

Hayes, Frank, III: *See—*
Light, David O., Jr.; Hayes, Frank, III; and McGinty, Joseph R., 4,494,079, Cl. 331-1.00A.

Haynes, Eugene M., to Owens-Corning Fiberglas Corporation. Repair of double shell heat exchangers. 4,493,367, Cl. 165-72.000.

Hazel, Robert L.; and LaBudde, Edward V., to Burroughs Corporation. Three beam optical memory system. 4,494,226, Cl. 369-45.000.

Hedrick, Harold N.; and Whitney, Solon G., to American Petro Mart, Inc. Method of using higher concentration sulfuric acid for stripping and precipitation of adsorbed magnesium. 4,493,907, Cl. 521-26.000.

Heiman, Frederic P., to Mars, Inc. Self tuning low frequency phase shift coin examination method and apparatus. 4,493,411, Cl. 194-100.00A.

Heine, Otto R., to R&H Technology, Inc. Gearless speed and torque converter. 4,493,222, Cl. 74-216.300.

Heise, Richard L.: *See—*
Olmsted, James F.; Webster, Sherwood F.; and Heise, Richard L., 4,493,750, Cl. 159-48.100.

Helava, Heikki I.: *See—*
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.

Hemmer, Valentine J.: *See—*
Piscitelli, R. Amelia; Hemmer, Valentine J.; and Shepler, Eric F., 4,493,527, Cl. 339-258.00R.

Hemmi, Keiji: *See—*
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.

Hemphill, Dean P.: *See—*
Ayers, Ray R.; and Hemphill, Dean P., 4,493,590, Cl. 405-170.000.

Hendricks, Terry J.: *See—*
Blaske, T. Allen; and Hendricks, Terry J., 4,493,939, Cl. 136-212.000.

Hendrickson, James L.: *See—*
Fuller, Charles C.; and Hendrickson, James L., 4,493,486, Cl. 273-25.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Moller, Hinrich; Wallat, Siegfried; Bartnik, Friedhelm; and Pittermann, Wolfgang, 4,493,823, Cl. 424-70.000.

Henry, John W., IV, to United States of America, Navy. Mechanism for proportionately loading dual thrust bearing assemblies against axial thrust loads. 4,493,514, Cl. 384-613.000.

Hensley, Albert L., Jr.; and Quick, Leonard M., to Standard Oil Company (Indiana). Catalytic hydroliquefaction using a Cr-Mo-Group VIII catalyst. 4,493,761, Cl. 208-10.000.

Henze, Siegfried: *See—*
Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, 4,493,234, Cl. 83-175.000.

Hepler, Edward L.: *See—*
Brahm, David J.; Grinn, James M.; Hepler, Edward L.; and Sullivan, John M., 4,494,193, Cl. 364-200.000.

Hermann, Axel: *See—*
Hermann, Bruno, deceased; and Hermann, Axel, 4,493,356, Cl. 160-133.000.

Hermann, Bruno, deceased (by Hermann, Eleonore, heir); and Hermann, Axel, to Hermann Haus GmbH. Roller shutter installation and safety apparatus. 4,493,356, Cl. 160-133.000.

Hermann, Eleonore, heir: *See—*
Hermann, Bruno, deceased; and Hermann, Axel, 4,493,356, Cl. 160-133.000.

Hermann, Ferdinand: *See—*
Bader, Leonhard; Hermann, Ferdinand; Ruprich, Wilhelm; and Winter, Hermann, 4,493,137, Cl. 29-25.350.

Hermann Haus GmbH: *See—*
Hermann, Bruno, deceased; and Hermann, Axel, 4,493,356, Cl. 160-133.000.

Hershkowitz, Frank: *See—*
Rhodes, Richard P.; and Hershkowitz, Frank, 4,493,763, Cl. 208-11.00R.

Hesston Corporation: *See—*
Hill, Amos G.; and Wiens, Arlen J., 4,493,601, Cl. 414-491.000.

Hettel, Hans: *See—*
Haas, Peter; and Hettel, Hans, 4,493,909, Cl. 521-166.000.

Heuberger, Anton: *See—*
Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, 4,493,753, Cl. 204-9.000.

Hewlett-Packard Company: *See—*
Neukermans, Armand P., 4,494,036, Cl. 313-420.000.
Vaught, John L., 4,494,128, Cl. 346-140.00R.

Heymes, Alain: *See—*
Chekroun, Isaac; and Heymes, Alain, 4,493,931, Cl. 546-329.000.

Hibino, Yozo; Kamejima, Kohji; and Nara, Yasuaki, to Hitachi, Ltd. Operation device for absorption cold and warm water system utilizing solar heat. 4,493,192, Cl. 62-141.000.

Hickerson, Richard A.: *See—*
Thompson, Lionel D.; Jenkins, Harold E.; Hickerson, Richard A.; and Weaver, Russell E., 4,493,303, Cl. 123-357.000.

Hidebran, Dean C.: *See—*
Hildebrand, Clifford F., 4,493,658, Cl. 440-30.000.

Higashine, Kazutaka: *See—*
Fujiwara, Koichi; Sakai, Tomohiko; Yamada, Yoneo; and Higashine, Kazutaka, 4,493,739, Cl. 148-111.000.

Hildebrand, Clifford F., to Hidebran, Dean C. Paddle boat. 4,493,658, Cl. 440-30.000.

Hill, Amos G.; and Wiens, Arlen J., to Hesston Corporation. High capacity, self-unloading forage hopper. 4,493,601, Cl. 414-491.000.

Hill, Jeremy R.; and Malinouskas, Donald, to United States Surgical Corporation. Automatic blood pressure system with servo controlled inflation and deflation. 4,493,326, Cl. 128-680.000.

Hillary, Brian, to WKR Limited. Electrical socket connector. 4,493,517, Cl. 339-42.000.

Hilton, Graham H., to De La Rue Systems Limited. Detecting the condition of a sheet. 4,493,994, Cl. 250-223.00R.

Hilton, Kenneth R.: *See—*
McCreedy, Kathleen M.; and Hilton, Kenneth R., 4,493,927, Cl. 528-381.000.

Hirao, Hideo: *See—*
Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, 4,494,159, Cl. 360-78.000.

Hirobe, Kazushi; Tonoki, Satoshi; and Nishigaki, Masahiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Flame resistant resin composition. 4,493,913, Cl. 523-205.000.

Hirtz, Jean-Pierre: *See—*
Di Forte Poisson, Marie-Antoinette; Hirtz, Jean-Pierre; Duchemin, Jean-Pascal; and de Cremoux, Baudouin, 4,494,237, Cl. 372-45.000.

Hisada, Yoshio: *See—*
Furuzawa, Kunihiko; Funaki, Yuji; Hisada, Yoshio; and Izumi, Kazuo, 4,493,842, Cl. 424-273.00R.

Hisamatsu, Minoru: *See—*
Fujie, Akira; and Hisamatsu, Minoru, 4,493,788, Cl. 252-511.000.

Hitachi Cable, Ltd.: *See—*
Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,493,530, Cl. 350-96.340.

Hitachi Chemical Company, Ltd.: *See—*
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.
Ueyama, Tamotsu; and Yamada, Takao, 4,493,789, Cl. 252-514.000.

Hitachi, Ltd.: *See—*
Funakoshi, Tadayoshi; and Takeda, Kazuo, 4,493,611, Cl. 415-199.100.
Hibino, Yozo; Kamejima, Kohji; and Nara, Yasuaki, 4,493,192, Cl. 62-141.000.
Horiba, Tatsuo; Iwamoto, Kazuo; Kawana, Hidejiro; Fujita, Kazunori; and Tamura, Kohki, 4,493,878, Cl. 429-12.000.
Iino, Toshiki; Kaneko, Hiromi; Takagi, Michiyuki; and Komatsu, Kazuhiro, 4,493,610, Cl. 415-104.000.
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.
Kaneko, Masaharu; Ozawa, Tetsuo; Yoneyama, Tomio; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,493,532, Cl. 350-349.000.

Nakane, Keiichi; Kamiuchi, Toshiro; and Nakanishi, Hiroaki, 4,494,188, Cl. 364-200.000.
Nishijima, Hideo; Sera, Katsumi; Fukushima, Isao; and Kobori, Yasunori, 4,494,056, Cl. 318-269.000.
Noguchi, Kouki; Tsunehiro, Takashi; and Nakamura, Hideo, 4,494,195, Cl. 364-200.000.
Shibata, Atsushi; and Ueno, Yukichi, 4,494,005, Cl. 250-492.200.
Shii, Kazuo; Kobayashi, Hiroyuki; Kubozoe, Morioki; and Isakozawa, Shigeto, 4,494,000, Cl. 250-311.000.
Shima, Yoshihiro; Kashioka, Seiji; Uno, Takeshi; and Suzuki, Kunio, 4,494,139, Cl. 358-101.000.
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.
Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Kodama, Naoki, 4,494,216, Cl. 365-36.000.
Yamaoka, Hiromasa; Iwasa, Yuzaburo; and Matunaga, Kazuhisa, 4,494,113, Cl. 340-825.500.
Yamauchi, Koji, 4,493,984, Cl. 219-501.000.

Hitachi Microcomputer Engineering, Ltd.: *See—*
Nishijima, Hideo; Sera, Katsumi; Fukushima, Isao; and Kobori, Yasunori, 4,494,056, Cl. 318-269.000.

Hittenberger, William H.: *See—*
Bryson, John W.; and Hittenberger, William H., 4,493,682, Cl. 493-174.000.

Hiyama, Torao: *See—*
Noji, Tasuku; and Hiyama, Torao, 4,494,095, Cl. 334-85.000.

Hobbs, John R., to Rolls-Royce Limited. Gas turbine engine air intake. 4,493,185, Cl. 60-39.092.

Hobson Limited: *See—*
Stewart, David E.; and Nicholson, George R., 4,493,229, Cl. 76-107.00A.

Hoechst Aktiengesellschaft: *See—*
Cherdron, Harald; Gordon, Wolfgang; and Kloos, Friedrich, 4,493,751, Cl. 162-157.200.
Horlein, Gerhard; Schonowsky, Hubert; Bieringer, Hermann; and Langeluddeke, Peter, 4,493,731, Cl. 71-118.000.
Idstein, Hermann, 4,493,123, Cl. 15-4.000.
Kleiner, Hans-Jerg; and Dursch, Walter, 4,493,803, Cl. 260-968.000.

Hoffman, Louis S.: *See—*
Bohmer, William; Betancourt, Walter J.; and Hoffman, Louis S., 4,493,531, Cl. 350-336.000.

Hoffmann, Frank F., to Florkey's Conveyor Service, Inc. Wear compensating link pin. 4,493,680, Cl. 474-230.000.

Hoffmann-La Roche Inc.: *See—*
Derungs, Romano, 4,493,841, Cl. 424-273.00R.
Petrzilka, Martin; Pracht, Inge; and Ruf, Urs, 4,493,533, Cl. 350-418.000.

Hogan, John P., to Phillips Petroleum Company. Removal of carbon dioxide from olefin containing streams. 4,493,715, Cl. 55-68.000.

Holmes, Edward S. B., to Northern Telecom Limited. Thermal Fuse. 4,494,104, Cl. 337-403.000.

Holobaugh, Raymond E., to Mobasco Corporation. Height adjustment control arrangement. 4,493,469, Cl. 248-406.100.

Holoubek, Andrew J.: *See—*
Sedam, Jason K.; Mueller, Richard J.; and Holoubek, Andrew J., 4,493,441, Cl. 222-129.100.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao, 4,493,402, Cl. 192-326.000.
Nakajima, Tetsuo; and Kumata, Hirotaka, 4,493,304, Cl. 123-479.000.
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, 4,494,116, Cl. 340-995.000.
Yuzui, Katsutoshi, 4,493,450, Cl. 228-49.00R.

Honda Motor Co., Ltd.: *See—*
Hasegawa, Shumpei, 4,493,300, Cl. 123-325.000.
Ikenoya, Yasuo, 4,493,677, Cl. 474-93.000.

Honda, Norio, to Fujitsu Limited. Integrated circuit device having easily cleaned region between mother board and chip carriers mounted thereon. 4,493,145, Cl. 29-840.000.

Honeywell Inc.: *See—*
Bayer, Stephen J.; and Olsen, Arthur M., 4,494,183, Cl. 364-154.000.
Reynolds, George O., 4,493,555, Cl. 356-358.000.

Honeywell Information Systems Inc.: *See—*
Goss, Gary J.; Kelly, Richard P.; and Murray, Thomas L., Jr., 4,494,186, Cl. 364-200.000.
Kaplan, Jay; and Marchant, Ray, 4,493,524, Cl. 339-125.00R.
Peters, Arthur, 4,494,190, Cl. 364-200.000.

Honig, Gunter: *See—*
Gast, Theodor; Binder, Kurt; and Honig, Gunter, 4,493,215, Cl. 73-861.180.

Honji, Akio: *See—*
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.

Hori, Yoshimi; Ishida, Takashi; and Hayashi, Keizo, to Toyoda Gosei Co., Ltd. Spacer in metal-mold vulcanizer for rubber hose. 4,493,632, Cl. 425-393.000.

Horiba, Ltd.: *See—*
Yagi, Taizo, 4,494,089, Cl. 332-14.000.

Horiba, Tatsuo; Iwamoto, Kazuo; Kawana, Hidejiro; Fujita, Kazunori; and Tamura, Kohki, to Hitachi, Ltd. Fuel element for liquid fuel cell and a liquid fuel cell. 4,493,878, Cl. 429-12.000.

Horibe, Osamu, to Nissan Motor Company, Limited. Vacuum suspended type servo device. 4,493,243, Cl. 91-369.00B.

Horlein, Gerhard; Schonowsky, Hubert; Bieringer, Hermann; and Langeluddeke, Peter, to Hoechst Aktiengesellschaft. Herbicidal agents. 4,493,731, Cl. 71-118.000.

Horn, Friedrich: *See—*
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, 4,494,101, Cl. 336-210.000.

Hornacek, Kenneth J.: *See—*
Kirsch, Jerry; Kirsch, Kerry F.; and Hornacek, Kenneth J., 4,493,245, Cl. 92-2.000.

Hornung, Friedrich: *See—*
Gunther, Klaus; Hornung, Friedrich; Paule, Kurt; and Schadlich, Fritz, 4,493,377, Cl. 173-170.000.

Horvath, Ibolya: *See—*
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.

Hosel, Fritz, to Trutzschler GmbH & Co. KG. Carding machine or roller card. 4,494,204, Cl. 364-470.000.

Hoshino, Michio; and Someya, Riyouichi, to Mabuchi Motor Co., Ltd. Brushgear. 4,494,029, Cl. 310-239.000.

Hosiden Electronics Co., Ltd.: *See—*
Masuda, Toru, 4,493,526, Cl. 339-183.000.

Hotchkiss-Brandt-Sogeme-H.B.S.: *See—*
Eyer, Jean, 4,493,484, Cl. 271-220.000.

Hotta, Toshihiro, to Kabushiki Kaisha Morita Seisakusho. Speed control system for small medical motors. 4,494,057, Cl. 318-317.000.

Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., to General Motors Corporation. Method and apparatus for predicting and controlling the quality of a resistance spot weld. 4,493,965, Cl. 219-109.000.

House, V. Dean, to Spectra-Symbol Corporation. Touch-controlled circuit apparatus for voltage selection. 4,494,105, Cl. 338-114.000.

Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See—*
Knigge, Rolf; and Albien, Wolfgang, 4,493,857, Cl. 427-96.000.

Howard, Derik: *See—*
Smith, Guy L. B.; Howard, Derik; and Goedhals, Anton B., 4,494,106, Cl. 340-58.000.

Howlett, James J.; and Zagranski, Raymond D., to Chandler Evans Inc. Helicopter engine torque compensator. 4,493,465, Cl. 244-17.130.

Huang, Vincent M.: *See—*
Macriss, Robert A.; Wurm, Jaroslav; and Huang, Vincent M., 4,493,364, Cl. 165-1.000.

Hubbert, Gordon F., to Gladd Industries, Inc. Bake oven with manifold. 4,493,641, Cl. 432-120.000.

Hudson, Dannie B. Compensating valve system for controlling adjustable emulsifying orifice. 4,493,558, Cl. 366-341.000.

Hudson Engineering Company: *See—*
Napolitano, Pellegrino E., 4,493,607, Cl. 415-11.000.

Hughes Aircraft Company: *See—*
Doty, John S., 4,493,529, Cl. 350-96.200.
Graves, Ross E., 4,494,118, Cl. 343-424.000.
Sutter, Leroy V., Jr., 4,494,236, Cl. 372-25.000.

Hughes, Enoch A. Apparatus to open and close a meter ring. 4,493,230, Cl. 81-3.00R.

Hughes, Richard S., to United States of America, Navy. Pin diode linear attenuator controlled by a companding DAC. 4,494,084, Cl. 333-81.00R.

Hunsinger, Werner: *See—*
Echtler, Theodor; Quinot, Martin; and Hunsinger, Werner, 4,493,122, Cl. 14-2.400.

Hunter Douglas Inc.: *See—*
Anderson, Richard N., 4,493,357, Cl. 160-174.000.

Huret, Alain P. B., legal representative: *See—*
Huret, Roger, deceased; Huret, Alain P. B., legal representative; and Huret, Gerard, legal representative, 4,493,489, Cl. 280-238.000.

Huret et ses Fils: *See—*
Huret, Roger, deceased; Huret, Alain P. B., legal representative; and Huret, Gerard, legal representative, 4,493,489, Cl. 280-238.000.

Huret, Gerard, legal representative: *See—*
Huret, Roger, deceased; Huret, Alain P. B., legal representative; and Huret, Gerard, legal representative, 4,493,489, Cl. 280-238.000.

Huret, Roger, deceased; by Huret, Alain P. B., legal representative; and by Huret, Gerard, legal representative, to Huret et ses Fils. Device for fixing a derailleur on a frame lug. 4,493,489, Cl. 280-238.000.

Hurley, James R.; Searight, Edward F.; and Nunes, Maurice, to Thermo Electron Corporation. Radiant/conductive broiler. 4,493,308, Cl. 126-41.00R.

Huskvarna Transtortkonstruktionar A.B.: *See—*
Nilsson, Weimar, 4,493,133, Cl. 24-68.00T.

Husted, Royce H., to Shiber, Samuel. Expandible sprocket. 4,493,678, Cl. 474-164.000.

Hutcheson, Don S., to United States of America, Navy. Fuel air explosive device. 4,493,262, Cl. 102-363.000.

Hutchins, Nancy K., executrix: *See—*
Hampson, Alfred A.; Hutchins, Thomas B., deceased; and Hutchins, Nancy K., executrix, 4,493,989, Cl. 235-464.000.

Hutchins, Thomas B., deceased: *See—*
Hampson, Alfred A.; Hutchins, Thomas B., deceased; and Hutchins, Nancy K., executrix, 4,493,989, Cl. 235-464.000.

Hwang, James C., to AT&T Bell Laboratories. III-V Based semiconductor devices and a process for fabrication. 4,493,142, Cl. 29-575.000.

Hyllberg, Bruce E.; and Brands, George B., to American Roller Company. Voltage applicator for limiting charge distribution in ESA printing equipment. 4,493,256, Cl. 101-216.000.

IBEK Ingenieurbuero Echtler Kaiserslautern GmbH: *See*—
Echtler, Theodor; Quinot, Martin; and Hunsinger, Werner, 4,493,122, Cl. 14-2.400.
Echtler, Theodor, 4,493,284, Cl. 114-267.000.

Ichimura, Etsuo, to Kanto Seiki Co., Limited. Odometer using an electric motor disposed within annular figure wheels. 4,493,988, Cl. 235-96.000.

ICI Americas, Inc.: *See*—
Yellin, Tobias O.; and Gilman, David J., 4,493,840, Cl. 424-269.000.

ICM S.p.A. Italiana Costruzioni Metalmeccaniche: *See*—
Bucefari, Massimo; and Scortecci, Giuseppe, 4,493,183, Cl. 59-16.000.

IDN Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 4,493,417, Cl. 206-387.000.

Ido, Tadashi: *See*—
Kubo, Osamu; Ido, Tadashi; Nomura, Tutomu; and Maeda, Tatsumi, 4,493,874, Cl. 428-403.000.

Idstein, Hermann, to Hoechst Aktiengesellschaft. Pressure-contact and lift-off arrangement. 4,493,123, Cl. 15-4.000.

Igarashi, Yoshimasa: *See*—
Ai, Minoru; Manabe, Akira; Igarashi, Yoshimasa; and Mizuno, Katsuya, 4,493,644, Cl. 433-75.000.

Igarasi, Seizi: *See*—
Miyashiro, Yutaka; Ogawa, Masao; Yamazaki, Yoshio; and Igarasi, Seizi, 4,493,894, Cl. 435-178.000.

Iida, Teruhiko: *See*—
Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, 4,494,159, Cl. 360-78.000.

Iino, Toshiki; Kaneko, Hiromi; Takagi, Michiyuki; and Komatsu, Kazuhiro, to Hitachi, Ltd. Axial thrust balancing system. 4,493,610, Cl. 415-104.000.

Iio, Masahiro, to Diesel Kiki Co., Ltd. Lubricating oil-separating device in a refrigerant compressor for air conditioning systems. 4,493,624, Cl. 418-98.000.

Ikeda, Masaki: *See*—
Nishino, Atsushi; Ikeda, Masaki; Kimura, Kunio; and Oyabu, Hajime, 4,493,900, Cl. 501-26.000.

Ikeda, Tadashi: *See*—
Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Kodama, Naoki, 4,494,216, Cl. 365-36.000.

Ikekame, Hiroo; and Karasawa, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Three-dimensional insulating structure for high voltage components. 4,494,173, Cl. 361-429.000.

Ikenoya, Yasuo, to Honda Motor Co., Ltd. Belt transmission having circulated air cooling function. 4,493,677, Cl. 474-93.000.

Iljushin, Alexei A.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,493,140, Cl. 29-446.000.

Illinois Tool Works, Inc.: *See*—
Borja, Jesus, 4,493,467, Cl. 248-56.000.
Ruehl, William E., 4,493,580, Cl. 403-252.000.
Sharp, Larry L.; and Klosinski, Mark, 4,493,219, Cl. 73-862.050.

Imahashi, Jinichi: *See*—
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.

Imazeki, Ryoji; and Kusumi, Katsuaki, to Fujitsu Fanuc Limited. Control device for indexing a stepping rotatable member. 4,494,206, Cl. 364-474.000.

Imazeki, Shuji: *See*—
Kaneko, Masaharu; Ozawa, Tetsuo; Yoneyama, Tomio; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,493,532, Cl. 350-349.000.

IMDEC S.R.L.: *See*—
Silvestrini, Jesus A., 4,493,851, Cl. 426-482.000.

Imperial Chemical Industries PLC: *See*—
Birkett, Kevin; Scovell, Edward G.; and John, Glyn R., 4,493,876, Cl. 428-457.000.
Boulton, Thomas W.; and Derwent, Brian J., 4,493,759, Cl. 204-252.000.
Edgerley, Peter G.; and Oldland, Sidney R. D., 4,493,871, Cl. 428-308.400.
Hargreaves, Rodney B.; and McLoughlin, Bernard J., 4,493,835, Cl. 424-246.000.
Newton, David F.; and Thompson, David J., 4,493,785, Cl. 252-299.100.
Yellin, Tobias O.; and Gilman, David J., 4,493,840, Cl. 424-269.000.

Ina, Kenzo; and Hara, Teruya, to Canon Kabushiki Kaisha. Information readout apparatus. 4,494,157, Cl. 360-48.000.

Indiana Brass, Inc.: *See*—
Arnold, Don C.; and Wilcox, Thomas J., 4,493,343, Cl. 137-625.170.

Industrie Zanussi S.p.A.: *See*—
Bianchi, Giuseppe, 4,493,760, Cl. 204-278.000.

Inmos Corporation: *See*—
Hardee, Kim C.; and Sud, Rahul, 4,494,221, Cl. 365-203.000.

Inokuchi, Haruhisa; and Sakai, Takami, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device for a converter. 4,494,179, Cl. 363-35.000.

Inoue, Seiji; and Harada, Norimichi, to Yamaha Hatsudoki Kabushiki Kaisha. Tilt-up angle sensing system for inboard-outboard drives. 4,493,656, Cl. 440-2.000.

Inoue, Yoshikazu: *See*—
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,493,834, Cl. 424-246.000.

Institute of Gas Technology: *See*—
Macrisa, Robert A.; Wurm, Jaroslav; and Huang, Vincent M., 4,493,364, Cl. 165-1.000.

Inteleplex Corporation, The: *See*—
Sues, John M.; and Cupani, Carmine, 4,493,948, Cl. 179-2.00A.

Interlab, Inc.: *See*—
Layton, Howard M., 4,493,333, Cl. 134-76.000.

Intermatic Incorporated: *See*—
Coker, Charles W., 4,494,012, Cl. 307-132.00E.

International Business Machines Corporation: *See*—
Bean, George H.; and Gum, Peter H., 4,494,189, Cl. 364-200.000.
Brickman, Norman F.; and Rosenbaum, Walter S., 4,494,150, Cl. 358-260.000.
Call, Mark G., 4,494,080, Cl. 331-8.000.
Chen, Lee; Khoury, Henri A.; and Seymour, Harlan R., 4,493,745, Cl. 156-626.000.
Clemen, Rainer; and Haug, Werner, 4,494,018, Cl. 307-482.000.
Goel, Prabhakar; and McMahon, Maurice T., 4,494,066, Cl. 324-73.00R.
Kumar, Ananda H.; and Srikrishnan, Kris V., 4,493,856, Cl. 427-57.000.
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,494,108, Cl. 340-347.0DD.
Mauer, John L., IV; Michail, Michel S.; and Woodard, Ollie C., 4,494,004, Cl. 250-492.200.
Montegari, Frank A., 4,494,017, Cl. 307-463.000.
Patel, Arvind M., 4,494,234, Cl. 371-38.000.
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,493,855, Cl. 427-41.000.

International Electronic Technology Corp.: *See*—
Kaish, Norman, 4,494,114, Cl. 340-825.310.

International Flavors & Fragrances Inc.: *See*—
Klemarczyk, Philip T., 4,493,791, Cl. 252-522.00R.
Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., 4,493,790, Cl. 252-522.00R.

International Harvester Company: *See*—
Robinson, Edward L., Jr.; and Stamp, Tom G., 4,493,274, Cl. 111-88.000.

International Packaging Systems Inc.: *See*—
O'Malley, Michael P.; and Thibault, Alfred R., 4,493,627, Cl. 425-89.000.

International Paper Company: *See*—
Callahan, Kevin M., 4,493,860, Cl. 427-230.000.

Interstate Electronics Corporation: *See*—
Walter, Carlton H.; Bohley, Peter; and Couture, Robert P., 4,494,121, Cl. 343-708.000.

Iowa State University Research Foundation: *See*—
Platt, Kenneth B.; and Reed, David E., 4,493,825, Cl. 424-88.000.

Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Vehicle tire. 4,493,355, Cl. 152-329.000.

Iqbal, Sikandar, to Memorex Corporation. Water-based magnetic coating composition. 4,493,778, Cl. 252-62.540.

Iquad Company Incorporated: *See*—
Potter, John T., 4,493,571, Cl. 400-144.200.

Isakozawa, Shigeto: *See*—
Shii, Kazuo; Kobayashi, Hiroyuki; Kubozoe, Morioki; and Isakozawa, Shigeto, 4,494,000, Cl. 250-311.000.

Ischen, Gunter: *See*—
Grunsky, Manfred; Sussmuth, Reiner; Dehn, Dieter; and Ischen, Gunter, 4,493,596, Cl. 408-233.000.

Ishida, Takashi; and Shida, Masaharu, to Seiko Instruments & Electronics Ltd. Analogue alarm electronic timepiece. 4,493,559, Cl. 368-74.000.

Ishida, Takashi: *See*—
Hori, Yoshimi; Ishida, Takashi; and Hayashi, Keizo, 4,493,632, Cl. 425-393.000.

Ishida, Yasutaka: *See*—
Osawa, Hiroyuki; and Ishida, Yasutaka, 4,493,513, Cl. 384-533.000.

Ishihara Sangyo Kaisha, Ltd.: *See*—
Kimura, Fumio; and Haga, Takahiro, 4,493,730, Cl. 71-94.000.

Ishihara, Yoshihisa, to Japan Medical Supply Co. Ltd. Tubage used for intubation. 4,493,707, Cl. 604-164.000.

Ishii, Kenzo: *See*—
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.

Ishii, Sadamu: *See*—
Furutaka, Yasuhisa; and Ishii, Sadamu, 4,493,800, Cl. 260-465.00D.

Ishikawa, Takashi: *See*—
Nishizawa, Hiroshi; Sato, Tadayuki; and Ishikawa, Takashi, 4,493,858, Cl. 427-104.000.

Ishikawa, Takatoshi: *See*—
Endo, Katsusuke; Kato, Eiichi; Ohki, Nobutaka; and Ishikawa, Takatoshi, 4,493,888, Cl. 430-405.000.

Ishima, Kazumi, to Ricoh Company, Ltd. Power supply circuit. 4,494,178, Cl. 363-21.000.

Isover Saint-Gobain: *See*—
Ruechel, Frank, 4,493,345, Cl. 138-178.000.

Istituto Farmacologico Serono of Rome: *See*—
Sicuteri, Federigo, 4,493,830, Cl. 424-177.000.

Italfarmaco S.p.A.: *See*—
Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, 4,493,829, Cl. 424-177.000.
Ito, Hirosato; and Takada, Daizo, to Osaka Gas Company Limited. Oxygen-enriched air ratio control device for combustion apparatus. 4,493,635, Cl. 431-90.000.
Itoh, Takaaki: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,493,804, Cl. 261-44.00C.
Itoh, Toshiaki: *See*—
Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, 4,493,811, Cl. 376-254.000.
Itoh, Yoshifumi, to Mitsubishi Denki Kabushiki Kaisha. Simulation unit sharing the same CPU as a programming control unit. 4,494,191, Cl. 364-200.000.
ITT Industries, Inc.: *See*—
Elmis, Herbert, 4,494,243, Cl. 377-48.000.
Freyberger, Laurin C.; and Novotny, Bernd, 4,494,137, Cl. 358-27.000.
Schopper, Bernd; and Tandler, Peter, 4,493,508, Cl. 303-6.00C.
Sterling, Henley F., 4,493,996, Cl. 250-227.000.
Iventio AG: *See*—
Kindler, Gerhard, 4,493,398, Cl. 187-29.00R.
Ivy Medical, Inc.: *See*—
King, Roger A.; and Arnold, John E., Jr., 4,493,710, Cl. 604-250.000.
Iwahashi, Shoji, to Aisen Kogyo, Ltd. Massage means. 4,493,315, Cl. 128-60.000.
Iwai, Tomio, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Outboard engine. 4,493,661, Cl. 440-77.000.
Iwai, Yuzuru: *See*—
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, 4,493,845, Cl. 424-279.000.
Iwaisako, Toshiyuki: *See*—
Naito, Takeshi; Masamoto, Junzo; Iwaisako, Toshiyuki; and Matsuzaki, Kazuhiko, 4,493,752, Cl. 203-71.000.
Iwamoto, Kazuo: *See*—
Horiba, Tatsuo; Iwamoto, Kazuo; Kawana, Hidejiro; Fujita, Kazunori; and Tamura, Kohki, 4,493,878, Cl. 429-12.000.
Iwasa, Yuzaburo: *See*—
Yamaoka, Hiromasa; Iwasa, Yuzaburo; and Matunaga, Kazuhisa, 4,494,113, Cl. 340-825.500.
Iwashita, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Tilt-lock mechanism. 4,493,659, Cl. 440-61.000.
Izumi, Kazuo: *See*—
Furuzawa, Kunihiko; Funaki, Yuji; Hisada, Yoshio; and Izumi, Kazuo, 4,493,842, Cl. 424-273.00R.
Izuzo Motors, Ltd.: *See*—
Kawamura, Hideo, 4,493,298, Cl. 123-145.00A.
Izzo, Alexander P. Added feature to disposable diapers. 4,493,713, Cl. 604-385.000.
J. M. Voith GmbH: *See*—
Musselmann, Walter; Kinzler, Herbert; and Tra, Josef, 4,493,766, Cl. 209-362.000.
Jaakonmaki, Matti; and Raura, Pentti, to Rauma-Repola Oy. Wood chip shaver. 4,493,352, Cl. 144-162.00R.
Jackson, Gerald D., to Baker Oil Tools, Inc. Dynamic seal for well tools. 4,493,373, Cl. 166-321.000.
Jacobson, Jeff A. Apparatus and method for retaining pleats in hanging draperies. 4,493,358, Cl. 160-349.00R.
Jaedicke, Hagen; and Tonne, Peter, to BASF Aktiengesellschaft. Preparation of o,o'-dithiodibenzoic acids. 4,493,802, Cl. 260-507.00R.
Jagel, Peter H.: *See*—
Urbutis, Algimantas P.; and Jagel, Peter H., 4,493,130, Cl. 17-49.000.
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., to PLM Aktiebolag. Apparatus for moulding an article from plastic material. 4,493,633, Cl. 425-525.000.
Jameson, Robert L., to United States of America, Army. Elastic fragmentation sleeve. 4,493,264, Cl. 102-491.000.
Japan Exlan Company Limited: *See*—
Tanaka, Koji, 4,493,772, Cl. 210-799.000.
Japan Medical Supply Co. Ltd.: *See*—
Ishihara, Yoshihisa, 4,493,707, Cl. 604-164.000.
Jarosch, Harald: *See*—
Beikel, Alfons G.; and Jarosch, Harald, 4,493,350, Cl. 141-65.000.
Jarosz, John M.; and Panas, William R., to S&C Electric Company. High-speed, multi-break electrical switch. 4,494,103, Cl. 337-282.000.
Jedziniak, Francis J. Securable storage assembly for data processing device. 4,493,267, Cl. 108-50.000.
Jegousse, Michel: *See*—
de Sivry, Bruno; Sudreau, Bernard; Jegousse, Michel; and Le Hir, Yves, 4,493,966, Cl. 219-121.0EC.
Jeninga, John. Golf ball retriever. 4,493,503, Cl. 294-19.00A.
Jenkins, Harold E.: *See*—
Thompson, Lionel D.; Jenkins, Harold E.; Hickerson, Richard A.; and Weaver, Russell E., 4,493,303, Cl. 123-357.000.
Jernkontoret: *See*—
Fredriksson, Hasse; and Tiberg, Lars, 4,493,363, Cl. 164-476.000.
Jeter, John D.; and More, Henry S., to Exploration Logging, Inc. Well logging apparatus with replaceable sensor carrying insulating sleeve disposed in rotation restrained position around a drill string. 4,494,072, Cl. 324-347.000.
Jevons, Lyle O., Jr.: *See*—
Harris, Craig W.; Jevons, Lyle O., Jr.; and Loskorn, Richard A., 4,494,194, Cl. 364-200.000.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,493,911, Cl. 523-109.000.
Johannsen, Karl: *See*—
Becker, Willi; and Johannsen, Karl, 4,493,660, Cl. 440-67.000.
John, Erwin R.: *See*—
Bergelson, Michael; Fridman, Jacob; and John, Erwin R., 4,493,327, Cl. 128-731.000.
John, Glyn R.: *See*—
Birkett, Kevin; Scovell, Edward G.; and John, Glyn R., 4,493,876, Cl. 428-457.000.
Johnson, Douglas M., to Empak Inc. Wafer processing cassette. 4,493,418, Cl. 206-454.000.
Johnson Matthey PLC: *See*—
Collier, Owen N.; and Selman, Gordon L., 4,493,738, Cl. 148-24.000.
Johnson, Richard C.; and Norris, Allyn P., to Foster Wheeler Energy Corporation. Erosion test apparatus. 4,493,206, Cl. 73-7.000.
Johnson, Roger C.: *See*—
Gibbs, Richard D.; and Johnson, Roger C., 4,493,138, Cl. 29-33.00Q.
Johnston, Laverne, to LaMere, Dan, a part interest. Pacifier cover. 4,493,324, Cl. 128-360.000.
Joker System Aktiebolaget: *See*—
Jostler, Jan, 4,493,683, Cl. 493-225.000.
Jolissaint, Charles H., to Rolm Corporation. Interconnecting apparatus for a distributed switching telephone system. 4,494,229, Cl. 370-58.000.
Jones, Arthur A., to Nautilus Sports/Medical Industries, Inc. Exercising apparatus and method. 4,493,485, Cl. 272-126.000.
Jones, Brian D. Connector system. 4,493,172, Cl. 52-220.000.
Jones, C. David: *See*—
Zimmerman, Ronald E.; Burck, Philip J.; Jones, C. David; and Thakkar, Arvind L., 4,493,699, Cl. 604-55.000.
Jones, Robert W.: *See*—
Guch, Steve, Jr.; Gardner, Phillip J.; Braverman, Leonard W.; and Jones, Robert W., 4,494,235, Cl. 372-23.000.
Josefsson, Lars G.; Svensson, Bengt T.; and Moeschlin, Lars F., to Telefonaktiebolaget L M Ericsson. Impedance matching stripline transition for microwave signals. 4,494,083, Cl. 333-33.000.
Joseph Vogele AG: *See*—
Axer, Heinrich, 4,493,585, Cl. 404-102.000.
Joshi, David P., to Colgate-Palmolive Company. Translucent soaps and processes for manufacture thereof. 4,493,786, Cl. 252-368.000.
Jostler, Jan, to Joker System Aktiebolaget. Method of manufacturing bag-like packaging blanks provided with closure ribbons. 4,493,683, Cl. 493-225.000.
Juergens, Tristan: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Juergens, Tristan, 4,493,221, Cl. 474-14.000.
Julien, Paul C.: *See*—
Gruber, Robert J.; Agostine, Doretta; Julien, Paul C.; and Yourd, Raymond A., III, 4,493,883, Cl. 430-110.000.
K-Line Industries, Inc.: *See*—
Kammeraad, James A., 4,493,987, Cl. 235-1.00D.
Kabas, Guglielmo, deceased: *See*—
Burdeska, Kurt; Kabas, Guglielmo, deceased; Brunner, Hans-Georg; and Fory, Werner, 4,493,726, Cl. 71-87.000.
Kabas-Maskulinski, Anni, heir: *See*—
Burdeska, Kurt; Kabas, Guglielmo, deceased; Brunner, Hans-Georg; and Fory, Werner, 4,493,726, Cl. 71-87.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Nagano, Tamio, 4,493,408, Cl. 192-106.200.
Tamura, Kazuhisa; and Koshimo, Masahiko, 4,493,674, Cl. 464-68.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kajikawa, Masauemon; and Ota, Akio, 4,493,381, Cl. 175-107.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Hotta, Toshihiro, 4,494,057, Cl. 318-317.000.
Tachibana, Akifumi, 4,493,643, Cl. 433-27.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, 4,494,159, Cl. 360-78.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Hajime; Matsuyama, Shinichiro; and Arakawa, Akio, 4,494,203, Cl. 364-470.000.
Kadison, Eric M.; Batra, Subhash C.; and Meir, Gad E., to Media Systems Technology. Selectable format computer disk copier machine. 4,494,156, Cl. 360-48.000.
Kaegebein, Daniel P., to TX RX Systems, Inc. Fixture for mounting cylindrical cavity filters. 4,493,422, Cl. 211-26.000.
Kaeslin, Oscar E.; and Schenker, Monroe H. Cornering device for a garment support structure. 4,493,423, Cl. 211-123.000.
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Fuel cell. 4,493,879, Cl. 429-41.000.
Kai, Norichika: *See*—
Musto, Richard L.; and Kai, Norichika, 4,493,269, Cl. 110-106.000.
Kaish, Norman, to International Electronic Technology Corp. Security arrangement for and method of rendering microprocessor-controlled electronic equipment inoperative after occurrence of disabling event. 4,494,114, Cl. 340-825.310.

Kajikawa, Masanemon; and Ota, Akio, to Kabushiki Kaisha Komatsu Seisakusho. Turbodrill with a reduced drilling fluid pressure on a floating piston. 4,493,381, Cl. 175-107.000.

Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, to Hitachi Cable, Ltd. Single polarization optical fibers. 4,493,530, Cl. 350-96.340.

Kajiyama, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control system. 4,493,399, Cl. 187-29.00R.

Kaleida, Richard H., to AMP Incorporated. Membrane switch having integral switch tail insulator. 4,493,952, Cl. 200-5.00A.

Kalinowski, Robert S., Jr.: *See—*
Sanderson, Edward; Sanderson, Laurence S.; and Kalinowski, Robert S., Jr., 4,493,951, Cl. 179-175.30F.

Kalshoven, James E., Jr.: *See—*
Korb, Charles L.; and Kalshoven, James E., Jr., 4,493,553, Cl. 356-43.000.

Kaluza, Rudolph T. Continuous form multiple ply assembly. 4,493,496, Cl. 282-11.50A.

Kamejima, Kohji: *See—*
Hibino, Yozo; Kamejima, Kohji; and Nara, Yasuaki, 4,493,192, Cl. 62-141.000.

Kamiuchi, Toshiro: *See—*
Nakane, Keiichi; Kamiuchi, Toshiro; and Nakanishi, Hiroaki, 4,494,188, Cl. 364-200.000.

Kamiyama, Kouzi, to Fuji Photo Film Co., Ltd. Process for the preparation of ferrite magnetic particulate for magnetic recording. 4,493,779, Cl. 252-62.590.

Kammeraad, James A., to K-Line Industries, Inc. Counter. 4,493,987, Cl. 235-1.00D.

Kampff, Ronald J. Foot soaker and rester. 4,493,712, Cl. 604-293.000.

Kamphausen, Willi: *See—*
Beaujean, Holger; Kamphausen, Willi; Niephaus, Dieter; and Nommensen, Ove, 4,493,434, Cl. 222-3.000.

Kanamuller, Franz X.; and Phillips, Edwin R., to Sperry Corporation. Apparatus for optically detecting ink droplets. 4,493,993, Cl. 250-222.100.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Hirobe, Kazushi; Tonoki, Satoshi; and Nishigaki, Masahiko, 4,493,913, Cl. 523-205.000.

Kaneko, Hiromi: *See—*
Iino, Toshiki; Kaneko, Hiromi; Takagi, Michiyuki; and Komatsu, Kazuhiro, 4,493,610, Cl. 415-104.000.

Kaneko, Masaharu; Ozawa, Tetsuo; Yoneyama, Tomio; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, to Hitachi, Ltd.; and Mitsubishi Chemical Industries, Ltd. Pleochroic azo dyes, a liquid crystal composition containing the azo dyes and a display device using the liquid crystal composition. 4,493,532, Cl. 350-349.000.

Kaneko, Shuzo; Tamura, Yasuyuki; and Takahashi, Tohru, to Canon Kabushiki Kaisha. Image formation method and apparatus. 4,493,882, Cl. 430-97.000.

Kaneko, Takeru: *See—*
Sugimoto, Hachiro; Hamano, Sachiyuki; Shoji, Tadao; Kaneko, Takeru; and Uzuo, Takeshi, 4,493,837, Cl. 424-253.000.

Kaneko, Yutaka; and Takashi, Yokata, to Ricoh Company, Ltd. Laser printer. 4,494,130, Cl. 346-160.000.

Kanotz, William M.; Vesperman, William C.; and Wilson, Max K., to AT&T Technologies, Inc. Method for insulating conductors with a crystalline plastic material. 4,493,747, Cl. 156-64.000.

Kanto Seiki Co., Limited: *See—*
Ichimura, Etsuo, 4,493,988, Cl. 235-96.000.

Kanto Special Steel Works Ltd.: *See—*
Takahashi, Hiroyuki; and Ogata, Tomohiro, 4,493,360, Cl. 164-286.000.

Kao Soap Co., Ltd.: *See—*
Abe, Yoshiaki, 4,493,824, Cl. 424-70.000.

Kaplan, Jay; and Marchant, Ray, to Honeywell Information Systems Inc. Factory data collection terminal conduit enclosure. 4,493,524, Cl. 339-125.00R.

Karacsonyi, Bela: *See—*
Vajda, Gabor; Ravasz, Laszlo ; Karacsonyi, Bela; and Tabajdi, Gabor, 4,493,853, Cl. 426-582.000.

Karasawa, Yasuo: *See—*
Ikekame, Hiroo; and Karasawa, Yasuo, 4,494,173, Cl. 361-429.000.

Karlik, Richard L., to Nappi Trucking Corp. Apparatus for transporting truck tractors and truck units. 4,493,491, Cl. 280-402.000.

Karlsen, Stig, to Figgie International Inc. Brace lock for scaffolding. 4,493,394, Cl. 182-179.000.

Karlsson, Lars G., to Diab Barracuda AB. Camouflage material with partial apertures forming curled tongues and method of making the same. 4,493,863, Cl. 428-17.000.

Karr, Edward J. Rope clamping device. 4,493,134, Cl. 24-132.0WL.

Kashioka, Seiji: *See—*
Shima, Yoshihiro; Kashioka, Seiji; Uno, Takeshi; and Suzuki, Kunio, 4,494,139, Cl. 358-101.000.

Kasimov, Dzhangir A. K. O.: *See—*
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,493,140, Cl. 29-446.000.

Kataoka, Hiroyuki, to Canon Kabushiki Kaisha. Computer type electronic flash device. 4,494,044, Cl. 315-151.000.

Kato, Eiichi: *See—*
Endo, Katsusuke; Kato, Eiichi; Ohki, Nobutaka; and Ishikawa, Takatoshi, 4,493,888, Cl. 430-405.000.

Katou, Takashi: *See—*
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,493,804, Cl. 261-44.00C.

Katsube, Junki: *See—*
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; Sami, Shunsuke; Kojima, Atsuyuki; and Katsube, Junki, 4,493,846, Cl. 424-308.000.

Kauffman, Marc: *See—*
Rocci, Joseph D.; Crook, Stephen E.; and Kauffman, Marc, 4,494,111, Cl. 340-533.000.

Kaufmann, F. William, III; and Zwiebel, Alan, to Random House, Inc., a part interest. Fold-out garment book. 4,493,650, Cl. 434-178.000.

Kaul, Martin: *See—*
Weil, Wolfgang; Lanz, Andres; Vogt, Max; Meier, Paul; Kaul, Martin; and Fankhauser, Hanspeter, 4,493,962, Cl. 219-64.000.

Kawahara, Hiroshi; and Nakamura, Kazuo, to Brother Kogyo Kabushiki Kaisha. Type wheel changing mechanism in a printer. 4,493,569, Cl. 400-144.200.

Kawai, Mituo: *See—*
Yamamoto, Masao; Yebisuya, Takashi; Kawai, Mituo; and Tajima, Koichi, 4,493,733, Cl. 75-126.00B.

Kawakami, Hajime: *See—*
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; Sami, Shunsuke; Kojima, Atsuyuki; and Katsube, Junki, 4,493,846, Cl. 424-308.000.

Kawakami, Shigenobu: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,493,943, Cl. 174-25.00C.

Kawamura, Hideo, to Izuzo Motors, Ltd. Glow plug quick heating control device. 4,493,298, Cl. 123-145.00A.

Kawamura, Yoshihisa, to Nissan Motor Company, Limited. Fuel injection timing control system for an internal combustion engine. 4,493,302, Cl. 123-357.000.

Kawana, Hidejiro: *See—*
Horiba, Tatsuo; Iwamoto, Kazuo; Kawana, Hidejiro; Fujita, Kazunori; and Tamura, Kohki, 4,493,878, Cl. 429-12.000.

Kawara, Toshio; and Shibahara, Yoshihumi, to Shimadzu Corporation. Electromagnetic force-transducer. 4,494,022, Cl. 310-14.000.

Kaye, Arthur, to British Aerospace Public Limited Company. Control Apparatus. 4,494,061, Cl. 318-628.000.

Kazansky Aviatsionny Institut Imeni A. N Tupoleva: *See—*
Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., 4,493,213, Cl. 73-664.000.

Keane, John F.: *See—*
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.

Keane, John J.; and Pauze, Denis R., to General Electric Company. Corona-resistant wire enamel compositions and conductors insulated therewith. 4,493,873, Cl. 428-372.000.

Kearns, Robert W. Structure for and method of surface conditioning sensing and indicating and motor speed control. 4,494,059, Cl. 318-443.000.

Kearns, Robert W.; and Quan, James G. H. Digital to analog converter. 4,494,107. Cl. 340-347.0DA.

Keene, Harold J.: *See—*
Dusel, Robert O.; Berres, James J.; and Keene, Harold J., 4,493,233, Cl. 83-71.000.

Kelleher, Kevin C.; Kiser, Ned J.; and Christopher, Todd J., to RCA Corporation. DC Motor servo system. 4,494,052, Cl. 318-254.000.

Keller, Hans, to Geberit A.G. Welding sleeve. 4,493,985, Cl. 219-535.000.

Keller Holding AG: *See—*
Sporkenbach, Gustav-Adolf; and Suetterlin, Dieter, 4,493,805, Cl. 264-25.000.

Keller, Robert F., to RCA Corporation. Magnetron filament having a quadrilateral cross-section. 4,494,034, Cl. 313-341.000.

Kelly, Mary Y.: *See—*
Coffey, M. Dewayne; Kelly, Mary Y.; and Kennedy, Weldon C., Jr., 4,493,775, Cl. 252-8.55C.

Kelly, Richard P.: *See—*
Goss, Gary J.; Kelly, Richard P.; and Murray, Thomas L., Jr., 4,494,186, Cl. 364-200.000.

Kelly, Robert M.: *See—*
Robbins, Cheston W.; and Kelly, Robert M., 4,493,653, Cl. 434-262.000.

Kelvin Lenses Limited: *See—*
Tighe, Brian J.; and Gee, Howard J., 4,493,910, Cl. 523-108.000.

Kendrew, Thomas J.: *See—*
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,493,379, Cl. 175-57.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Avi, to Buddy L Corporation. Toy vehicle having spring-operated motor. 4,493,671, Cl. 446-464.000.

Kennedy, Weldon C., Jr.: *See—*
Coffey, M. Dewayne; Kelly, Mary Y.; and Kennedy, Weldon C., Jr., 4,493,775, Cl. 252-8.55C.

Kernforschungsanlage Julich GmbH: *See—*
Beaujean, Holger; Kamphausen, Willi; Niephaus, Dieter; and Nommensen, Ove, 4,493,434, Cl. 222-3.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, 4,493,753, Cl. 204-9.000.

Kessis, Theodore A.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.

Khoury, Henri A.: *See*—
Chen, Lee; Khoury, Henri A.; and Seymour, Harlan R., 4,493,745, Cl. 156-626.000.

Kibby, Charles L.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,493,905, Cl. 502-325.000.

Kidde, Inc.: *See*—
Sterner, Russell L., 4,493,426, Cl. 212-261.000.

Kilner, Jerome R.; Raymond, Eugene T.; and Warren, Steven M., to Boeing Company, The. Two-fluid nonflammable hydraulic system. 4,493,509, Cl. 303-13.000.

Kim, Kyung J., to United States of America, Navy. Gyrotron traveling-wave device including quarter wavelength anti-reflective dielectric layer to enhance microwave absorption. 4,494,039, Cl. 315-4.000.

Kim, Yoon H. Cosmetic towel. 4,493,866, Cl. 428-101.000.

Kimball International, Inc.: *See*—
DeLong, Charles E.; and Eck, Gary A., 4,493,237, Cl. 84-1.260.

Kimberly-Clark Corporation: *See*—
Meitner, Gary H., 4,493,868, Cl. 428-171.000.
Niethammer, Heinz K.; and Montgomery, Lawrence J., 4,493,116, Cl. 2-69.000.

Kimmel, David J.; and Lauterbach, John H., to AMP Incorporated. Rotary switch with internal rotor interconnecting circuit paths for surface contacts. 4,493,954, Cl. 200-11.00R.

Kimura, Fumio; and Haga, Takahiro, to Ishihara Sangyo Kaisha, Ltd. Phenoxypyridine useful as a herbicide. 4,493,730, Cl. 71-94.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Optical disc reproducing apparatus. 4,494,225, Cl. 369-44.000.

Kimura, Kunio: *See*—
Nishino, Atsushi; Ikeda, Masaki; Kimura, Kunio; and Oyabu, Hajime, 4,493,900, Cl. 501-26.000.

Kindler, Gerhard, to Iventio AG. Drive control for a transportation system, especially an elevator. 4,493,398, Cl. 187-29.00R.

Kinds Industri AB: *See*—
Lunding, Thorkild, 4,493,743, Cl. 156-555.000.

King, Olin B., to SCI Systems, Inc. Apparatus and method for recording both machine-readable and printed information. 4,494,127, Cl. 346-82.000.

King, Roger A.; and Arnold, John E., Jr., to Ivy Medical, Inc. Intravenous drip rate control device. 4,493,710, Cl. 604-250.000.

Kinzler, Herbert: *See*—
Musselmann, Walter; Kinzler, Herbert; and Tra, Josef, 4,493,766, Cl. 209-362.000.

Kioritz Corporation: *See*—
Nagashima, Akira; and Saito, Yasuo, 4,493,400, Cl. 188-77.00W.

Kircher, Stefan: *See*—
Fries, Herbert; Gerstenmaier, Jurgen; Kircher, Stefan; and Koch-Ducker, Jurgen, 4,493,210, Cl. 73-121.000.

Kirk, Russell F.: *See*—
Beard, Robert W.; and Kirk, Russell F., 4,493,704, Cl. 604-154.000.

Kirsch, Jerry; Kirsch, Kerry F.; and Hornacek, Kenneth J., to Rimrock Corporation. Rotary and linear actuating device. 4,493,245, Cl. 92-2.000.

Kirsch, Kerry F.: *See*—
Kirsch, Jerry; Kirsch, Kerry F.; and Hornacek, Kenneth J., 4,493,245, Cl. 92-2.000.

Kiser, Ned J.: *See*—
Kelleher, Kevin C.; Kiser, Ned J.; and Christopher, Todd J., 4,494,052, Cl. 318-254.000.

Kishi, Ichiro; and Nakagawa, Hisao, to Matsushita Electric Works, Ltd. Gear shifting speed change apparatus for a rotary electric tool. 4,493,223, Cl. 74-371.000.

Kitasato Kenkyusho: *See*—
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, 4,493,845, Cl. 424-27?.000.

Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Peptide, process for preparation thereof and use thereof. 4,493,794, Cl. 260-112.50R.

Klaue, Kaj, to Synthes Ltd. (U.S.A.). Surgical compression plate and drill guide. 4,493,317, Cl. 128-92.00D.

Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, to United States of America, Army. Medicinal 2-acetyl- and 2-propionylpyridine thiosemicarbazones and preparation thereof. 4,493,930, Cl. 544-360.000.

Kleiman, William J., to Rockwell International Corporation. Soldering tool for an robot. 4,493,449, Cl. 228-7.000.

Klein, Harold A., to Colt Industries Operating Corp. Compact multiple spindle boring head with quick change tool supports. 4,493,595, Cl. 408-46.000.

Kleiner, Hans-Jerg; and Dursch, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of vinylphosphonic acid diesters and vinylphosphonic acid. 4,493,803, Cl. 260-968.000.

Klemarczyk, Philip T., to International Flavors & Fragrances Inc. Substituted methyl isopropyl oxocyclohexane derivatives, organoleptic uses thereof and process for preparing same. 4,493,791, Cl. 252-522.00R.

Kliklok Corporation: *See*—
Bryson, John W.; and Hittenberger, William H., 4,493,682, Cl. 493-174.000.

Klochko, Viktor A.: *See*—
Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., 4,493,213, Cl. 73-664.000.

Klockner-Humboldt-Deutz AG: *See*—
Melcher, Gerhard; and Wuth, Wolfgang, 4,493,732, Cl. 75-24.000.

Kloos, Friedrich: *See*—
Cherdron, Harald; Gordon, Wolfgang; and Kloos, Friedrich, 4,493,751, Cl. 162-157.200.

Klosinski, Mark: *See*—
Sharp, Larry L.; and Klosinski, Mark, 4,493,219, Cl. 73-862.050.

Knigge, Rolf; and Albien, Wolfgang, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Method for applying a coating to a thin board. 4,493,857, Cl. 427-96.000.

Knight, Paul A.: *See*—
Marshall, Barry R.; and Knight, Paul A., 4,493,619, Cl. 417-307.000.

Knorr-Bremse GmbH: *See*—
Sander, Nils B. L.; and Nadas, Julius, 4,493,401, Cl. 188-199.000.

Knox, Lloyd C., to Halliburton Company. Grouting method. 4,493,592, Cl. 405-225.000.

Kobayashi, Hiroyuki: *See*—
Shii, Kazuo; Kobayashi, Hiroyuki; Kubozoe, Morioki; and Isakozawa, Shigeto, 4,494,000, Cl. 250-311.000.

Kobori, Yasunori: *See*—
Nishijima, Hideo; Sera, Katsumi; Fukushima, Isao; and Kobori, Yasunori, 4,494,056, Cl. 318-269.000.

Kobylinski, T. P.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,493,905, Cl. 502-325.000.

Koch-Ducker, Jurgen: *See*—
Fries, Herbert; Gerstenmaier, Jurgen; Kircher, Stefan; and Koch-Ducker, Jurgen, 4,493,210, Cl. 73-121.000.

Kochi, Hiromu: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,493,833, Cl. 424-246.000.

Kocol, James C.: *See*—
Gunderson, Robert O.; Kocol, James C.; and Schuck, David B., 4,494,185, Cl. 364-200.000.

Kodama, Naoki: *See*—
Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Kodama, Naoki, 4,494,216, Cl. 365-36.000.

Koel, Gerrit J.: *See*—
Auwerda, Cornelis P.; and Koel, Gerrit J., 4,493,721, Cl. 65-3.120.

Koerber, Charles F. Wheelchair lift apparatus. 4,493,602, Cl. 414-541.000.

Kohaut, John E., to Raceway Components, Inc. Automatic cable passage closure and sealing device. 4,493,173, Cl. 52-221.000.

Kohn, Erhard, to Telefunken Electronic GmbH. Semiconductor optoelectronic switch. 4,494,132, Cl. 357-30.000.

Kohno, Atsuo: *See*—
Ohmura, Hiroshi; Kohno, Atsuo; Shiiba, Minoru; and Tanaka, Tsutomu, 4,493,542, Cl. 354-82.000.

Koike, Takashi; and Sugiura, Hajime, to Fujitsu Limited. Disk system. 4,494,215, Cl. 364-900.000.

Kojima, Atsuyuki: *See*—
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; Sami, Shunsuke; Kojima, Atsuyuki; and Katsube, Junki, 4,493,846, Cl. 424-308.000.

Kokufukata, Seigo; and Sekido, Tetsuya, to Victor Company of Japan, Ltd. Temperature compensation circuit in a pickup tube device. 4,494,145, Cl. 358-163.000.

Kollmeyer, Willy D., to Shell Oil Company. 2-Cyano-tetrahydrofuran-5-methanols. 4,493,936, Cl. 549-474.000.

Kolzer, Walter: *See*—
Ramlohr, Franz; Pohl, Werner; and Kolzer, Walter, 4,494,181, Cl. 363-63.000.

Komatsu, Kazuhiro: *See*—
Iino, Toshiki; Kaneko, Hiromi; Takagi, Michiyuki; and Komatsu, Kazuhiro, 4,493,610, Cl. 415-104.000.

Komeda, Tadao, to Matsushita Electric Industrial Company, Limited. Method for formation of isolation oxide regions in semiconductor substrates. 4,493,740, Cl. 148-187.000.

Komine, Yoshio, to Canon Kabushiki Kaisha. Video camera. 4,494,147, Cl. 358-209.000.

Komoto, Akira: *See*—
Yano, Shozo; Komoto, Akira; and Fujinaga, Yasuhiro, 4,493,384, Cl. 177-25.000.

Koninklijke Nederlandse Papierfabrieken N.V.: *See*—
van Os, Rudi, 4,493,158, Cl. 34-41.000.

Konishi, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. High sensitivity sense amplifier using different threshold valued MOS devices. 4,494,020, Cl. 307-530.000.

Kopf, Rowland J., to Uniset Corporation. Fastener driving tool. 4,493,376, Cl. 173-139.000.

Koppers Company, Inc.: *See*—
Carson, William J., 4,493,286, Cl. 118-677.000.
Prew, Stanley R., 4,493,556, Cl. 366-114.000.

Korb, Charles L.; and Kalshoven, James E., Jr., to United States of America, National Aeronautics and Space Administration. Method of and apparatus for measuring temperature and pressure. 4,493,553, Cl. 356-43.000.

Korea Advanced Institute of Science and Technology: *See*—
Moon, Sang H.; Park, Jae M.; and Suh, Sung S., 4,493,725, Cl. 71-62.000.

Koshimo, Masahiko: *See*—
Tamura, Kazuhisa; and Koshimo, Masahiko, 4,493,674, Cl. 464-68.000.
Koshugi, Junichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cross-linked chitin derivatives. 4,493,928, Cl. 536-20.000.
Kostyrkin, Boris V.: *See*—
Prikhodko, Valery V.; and Kostyrkin, Boris V., 4,493,961, Cl. 219-69.00R.
Koszytorz, Gunther; Lucke, Herbert; Schlosser, Gerhard; and Vath, Joachim, to Siemens Aktiengesellschaft. Apparatus for automatically adjusting a deflection unit. 4,493,990, Cl. 250-201.000.
Kowles, Joseph E.: *See*—
Comeau, Joseph H.; Kowles, Joseph E.; Lareau, John P.; Mayo, Kenneth R.; and Runde, Herbert A., 4,493,155, Cl. 33-366.000.
Kozponti Valto- es Hitelbank RT. Innovacios Alap: *See*—
Vajda, Gabor; Ravasz, Laszlo ; Karacsonyi, Bela; and Tabajdi, Gabor, 4,493,853, Cl. 426-582.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Emsperger, Werner; and Engelhardt, Reiner, 4,493,186, Cl. 60-39.182.
Kramer, George H.: *See*—
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Krantz, Robert J., to Cyclops Corporation. Method for marking hot pipe. 4,493,859, Cl. 427-193.000.
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Krude, Werner, to Uni-Cardan Aktiengesellschaft. Rotary constant velocity joint. 4,493,676, Cl. 464-141.000.
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Kume, Nobuyuki; Yoshino, Harumi; and Nagaoka, Miyuki, to Matsushita Electric Industrial Company, Limited. Roll type capacitor having segmented metallized areas. 4,494,168, Cl. 361-273.000.
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Ohayon, Gerard; Reverchon, Bernard; Tourre, Bernard; and Vigier, Serge, 4,493,271, Cl. 110-262.000.
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Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., 4,493,701, Cl. 604-73.000.
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Legrand, Pierre; and Arnout, Michel, 4,493,969, Cl. 219-130.400.
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Lea, Jeffrey G.; and Carlson, David J., to RCA Corporation. Variable frequency U. H. F. local oscillator for a television receiver. 4,494,081, Cl. 331-36.00C.
Leary, Burton; and Silverio, Shaun, to Mupac Corporation. High-speed wire wrap board. 4,494,172, Cl. 361-400.000.
Leather, Robert P. Venous valve cutter for the incision of valve leaflets in situ. 4,493,321, Cl. 128-305.000.
Ledewitz, William. Collapsible dispensing container. 4,493,439, Cl. 222-94.000.
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LeDrew, Robert B., to Williamsburg Packaging Corporation. Box for display and dispensing articles. 4,493,453, Cl. 229-17.00B.
Lee, David M.; and Lindquist, Lloyd O., to United States of America, Energy. Method and apparatus for measuring reactivity of fissile material. 4,493,810, Cl. 376-254.000.
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Lehmann, Ulrich, to Dr. Ing. h.c.F. Porsche AG. Brake system, especially for a motor vehicle. 4,494,199, Cl. 364-426.000.
Leitgeb, Wilhelm, to Siemens Aktiengesellschaft. Commutating device for an electric motor supplied from a d-c voltage source. 4,494,049, Cl. 318-138.000.
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Lemmons, Joseph J., to PUR/ACC Corporation. Method and apparatus for orally dispensing liquid medication. 4,493,348, Cl. 141-1.000.
Lenders, Wilhelmus L. L., to U.S. Philips Corporation. Electromagnetic deflection unit. 4,494,097, Cl. 335-213.000.
Lenk, Erich, to Barmag Barmer Maschinenfabrik AG. Melt spinning apparatus. 4,493,628, Cl. 425-192.000.
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Leung, Frederick; and Weppelman, Roger M., to Merck & Co., Inc. Use of thyrotropin releasing hormone and related peptides as poultry growth promotants. 4,493,828, Cl. 424-177.000.
Lew, Eugene K.; and Wallace, Harvey W., to Sperry Corporation. High speed bus architecture. 4,494,192, Cl. 364-200.000.
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Liao, Henry H., to Xerox Corporation. 4-Pixel run-length code for data compression. 4,494,151, Cl. 358-261.000.
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Lin, Hung C. Optical scanning method of testing material defects. 4,494,069, Cl. 324-158.00R.
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Lo, Kun N. Mould used for making a racket frame. 4,493,472, Cl. 249-57.000.
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Lohmeijer, Johannes H. G. M., to General Electric Company. Light stable thermoplastic polyphenylene ether resin compositions comprising purple anthrapyridone dye or yellow quinophtalone dye. 4,493,915, Cl. 524-87.000.
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Lundberg, Jan A.; Wallgren, Goran T. L.; and Martinsson, Mats H., to Victor Hasselblad Aktiebolag. Device for data recording at photographic cameras. 4,493,543, Cl. 354-109.000.
Lundell Laboratories, Inc.: *See*—
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Lutz, Friedrich, to Ruti Machinery Works, Ltd. Weft insertion device for a band-gripper weaving machine. 4,493,347, Cl. 139-449.000.
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MacHose, Robert L. Carrier for transporting paintings and other substantially planar artwork. 4,493,504, Cl. 294-146.000.
Mack, Mark P., to Conoco Inc. Polymerization process for drag reducing substances. 4,493,903, Cl. 502-121.000.
Mack, Mark P., to Conoco Inc. Catalyst and method for preparation of drag reducing substances. 4,493,904, Cl. 502-122.000.
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Macriss, Robert A.; Wurm, Jaroslav; and Huang, Vincent M., to Institute of Gas Technology. Frost control for space conditioning. 4,493,364, Cl. 165-1.000.
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Magee, Robert L., Jr., to Arlington Automatics, Inc. Hydraulic setting tool. 4,493,374, Cl. 166-382.000.

Magnavox Government and Industrial Electronics Company: *See*—
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Maier, Bruce R.; and Flannery, Lincoln R., to P.A.S.T. Corporation. Firearm recoil protection system. 4,493,115, Cl. 2-2.000.

Maier, Herbert, to Telefunken Electronic GmbH. Method for making a semiconductor device by using capillary action to transport solder between different layers to be soldered. 4,493,143, Cl. 29-590.000.

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Mamedov, Bakhtiyar M. R. O.: *See*—
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Mars, Inc.: *See*—
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Marsh, Mervyn R. Drive transmission means. 4,493,188, Cl. 60-468.000.

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Martin, Erwin, to Siemens Aktiengesellschaft. Transducer plate for electro-acoustic transducers. 4,494,032, Cl. 310-324.000.

Martin, Gary D., to AT&T Bell Laboratories. Frame synchronization and phase ambiguity resolution in QAM transmission systems. 4,494,239, Cl. 375-39.000.

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Mason Corporation: *See*—
Corry, Jon C., 4,493,128, Cl. 16-197.000.

Mason, Jeff: *See*—
Reed, Kenneth E.; Mason, Bradley; Mason, Jeff; and Nelson, Gregory R., 4,493,316, Cl. 128-80.00C.

Masuda, Toru, to Hosiden Electronics Co., Ltd. Jack. 4,493,526, Cl. 339-183.000.

Masugi, Takashi: *See*—
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Mata, Jean-Pierre: *See*—
Bailleux, Christian; Bernard, Michel; Dupont, Bernard; Lozach, Guy; and Mata, Jean-Pierre, 4,493,917, Cl. 524-394.000.

Mathison, Allen D.; Nelson, Dale K.; and Cherne, Lloyd G., to Cherne Industries, Inc. Mechanical plug device. 4,493,344, Cl. 138-89.000.

Matra: *See*—
Lam, Do Mau, 4,494,200, Cl. 364-449.000.

Matsuda, Keiji: *See*—
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Matsuda, Shimpei: *See*—
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Matsui, Kazuma: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Gotou, Makoto, 4,494,053, Cl. 318-254.000.
Komeda, Tadao, 4,493,740, Cl. 148-187.000.
Kume, Nobuyuki; Yoshino, Harumi; and Nagaoka, Miyuki, 4,494,168, Cl. 361-273.000.
Nishino, Atsushi; Ikeda, Masaki; Kimura, Kunio; and Oyabu, Hajime, 4,493,900, Cl. 501-26.000.
Nonomura, Kinzo; Watanabe, Masanori; and Takesako, Yoshinobu, 4,493,666, Cl. 445-24.000.

Matsushita Electric Works, Ltd.: *See*—
Kishi, Ichiro; and Nakagawa, Hisao, 4,493,223, Cl. 74-371.000.
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Matsuzaki, Kazuhiko: *See*—
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Matthews, Stephen M.: *See*—
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.

Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., to Brudi Equipment, Inc. Side-loading container chassis storage rack. 4,493,421, Cl. 211-13.000.

Matunaga, Kazuhisa: *See*—
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Mauer, John L., IV; Michail, Michel S.; and Woodard, Ollie C., to International Business Machines Corporation. Electron beam system. 4,494,004, Cl. 250-492.200.

Maxudov, Faramaz G. O.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,493,140, Cl. 29-446.000.

May & Baker Limited: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, 4,493,843, Cl. 424-274.000.

Mayo, Kenneth R.: *See*—
Comeau, Joseph H.; Kowles, Joseph E.; Lareau, John P.; Mayo, Kenneth R.; and Runde, Herbert A., 4,493,155, Cl. 33-366.000.

Mayoux, Jean-Jacques, to Electronique Marcel Dassault. Installation for the transmission of informations by an optical bus line. 4,494,241, Cl. 375-76.000.

Mayrhofer, Max: *See*—
Fastner, Thorwald; Mayrhofer, Max; and Taschner, Walter, 4,493,452, Cl. 228-158.000.

Maysteel Corporation: *See*—
Moon, Michael L., 4,493,312, Cl. 126-299.00D.

Maytag Company, The: *See*—
Nelson, Robert B., 4,493,410, Cl. 194-1.00G.

McArthur, William A.: *See*—
Crawford, Lynn; and McArthur, William A., 4,493,329, Cl. 128-786.000.

McClure, Gary W. Boiler pipe assembly tool. 4,493,139, Cl. 29-267.000.

McCreedy, Kathleen M.; and Hilton, Kenneth R., to Dow Chemical Company, The. Condensation polymers of sulfur compounds and norbornenyl compounds. 4,493,927, Cl. 528-381.000.

McCullough, J. Douglas, Jr., to Shell Oil Company. High notched impact toughness propylene polymer compositions. 4,493,923, Cl. 525-88.000.

McGann, Leo E.: *See*—
Sedlatschek, Robert; and McGann, Leo E., 4,493,808, Cl. 264-108.000.

McGinty, Joseph R.: *See*—
Light, David O., Jr.; Hayes, Frank, III; and McGinty, Joseph R., 4,494,079, Cl. 331-1.00A.

McHale, William D.: *See*—
Kresge, Charles T.; Krishnamurthy, Sowmithri; and McHale, William D., 4,493,764, Cl. 208-138.000.

McIlwain, Michael E.; Grant, Jonathan F.; Golenko, Zsolt; and Wittstein, Alan D., to Geo-Centers, Inc. Plasma jet ignition device. 4,493,297, Cl. 123-143.00B.

McInnes, Malcolm B., to Pyrox Limited. Heat exchanger. 4,493,310, Cl. 126-92.00C.

McInnis, Donald E. Sound speaker stand for attenuating vibrations. 4,493,471, Cl. 248-580.000.

McLeod, Dale K.: *See*—
Garcia, Carlos M.; Reed, I. Ely; and McLeod, Dale K., 4,493,150, Cl. 30-97.000.

McLoughlin, Bernard J.: *See*—
Hargreaves, Rodney B.; and McLoughlin, Bernard J., 4,493,835, Cl. 424-246.000.

McMahon, Maurice T.: *See*—
Goel, Prabhakar; and McMahon, Maurice T., 4,494,066, Cl. 324-73.00R.

McMahon, Ronald G.; and Hale, Donnie E., to Contitronix, Inc. Front to back adjustment for carriage assembly. 4,493,566, Cl. 400-59.000.

McNaught, Richard P.: *See*—
Zanno, Paul R.; Parliment, Thomas H.; Soukup, Robert J.; and McNaught, Richard P., 4,493,852, Cl. 426-535.000.

Mead Corporation, The: *See*—
Wood, Prentice J., 4,493,415, Cl. 206-175.000.

Media Systems Technology: *See*—
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Medtronic, Inc.: *See*—
Hartlaub, Jerome T.; and Beckmann, Paul J., 4,493,325, Cl. 128-419.0PG.

Meier, Paul: *See*—
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Meiler, Hans E. Foulard machine. 4,493,197, Cl. 68-202.000.

Meir, Gad E.: *See*—
Kadison, Eric M.; Batra, Subhash C.; and Meir, Gad E., 4,494,156, Cl. 360-48.000.

Meitner, Gary H., to Kimberly-Clark Corporation. High bulk bonding pattern and method. 4,493,868, Cl. 428-171.000.

Melcher, Gerhard; and Wuth, Wolfgang, to Klockner-Humboldt-Deutz AG. Method for implementing pyro-metallurgical processes. 4,493,732, Cl. 75-24.000.

Memorex Corporation: *See*—
Iqbal, Sikandar, 4,493,778, Cl. 252-62.540.

Memorial Hospital for Cancer & Allied Diseases: *See*—
Fleisher, Martin, 4,493,892, Cl. 435-28.000.

Merck & Co., Inc.: *See*—
Doherty, James B.; Zimmerman, Morris; and Ashe, Bonnie M., 4,493,839, Cl. 424-263.000.
Leung, Frederick; and Weppelman, Roger M., 4,493,828, Cl. 424-177.000.
Veber, Daniel F.; and Freidinger, Roger M., 4,493,934, Cl. 548-550.000.

Merger, Franz; and Nestler, Gerhard, to BASF Aktiengesellschaft. Preparation of tertiary alcohols. 4,493,801, Cl. 260-465.600.

Merkle, Josef, to Daimler-Benz AG. Pneumatic spring for motor vehicles. 4,493,481, Cl. 267-64.270.

Merrel, Richard C., to Step Enterprises. Shaft straightening press with a traveling ram. 4,493,204, Cl. 72-389.000.

Merten, Rudolf: *See*—
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,493,861, Cl. 427-304.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Roth, Martin; and Stahn, Bernhard, 4,493,405, Cl. 192-18.00R.

Meyer, Fred J.; and Newman, Seymour, to Ford Motor Company. Silicate filled polyolefin resin composites. 4,493,918, Cl. 524-451.000.

Mezei, George: *See*—
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Michael, Ewald: *See*—
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Michael, Peter C., to Micro Consultants Limited. T.V. apparatus for movement control. 4,494,140, Cl. 358-105.000.

Michail, Michel S.: *See*—
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Michel, Stephen: *See*—
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Mickel, Susan: *See*—
Mielenz, Jonathan R.; and Mickel, Susan, 4,493,893, Cl. 435-172.300.

Micro Consultants Limited: *See*—
Michael, Peter C., 4,494,140, Cl. 358-105.000.

Micro Plastics Inc.: *See*—
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Micro-Quartz Technology Corp.: *See*—
Mittelsteadt, Robert A.; and Machesney, Gregory W., 4,493,960, Cl. 219-10.55B.

Micropump Corporation: *See*—
Pieters, Ferdinandus A., 4,493,625, Cl. 418-126.000.

Mielenz, Jonathan R.; and Mickel, Susan, to CPC International Inc. Process for cloning the gene coding for a thermostable alpha-amylase into *Escherichia coli* and *Bacillus subtilis*. 4,493,893, Cl. 435-172.300.

Migliorato, Piero: *See*—
Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., 4,494,133, Cl. 357-30.000.

Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials. 4,493,389, Cl. 430-572.000.

Mike, Nettie. Inspirational teaching apparatus. 4,493,652, Cl. 434-245.000.

Miki, Yukio: *See*—
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Miles Laboratories, Inc.: *See*—
Morris, David L., 4,493,890, Cl. 435-7.000.

Miles, Lee W.; Chambers, Samuel W.; and Rice, Mathias F., to Morrison-Knudsen Co., Inc. Rip-rap laying machine and method of laying rip-rap. 4,493,586, Cl. 405-17.000.

Miller, Harry, to Sperry Corporation. Enroute weight computer for aircraft. 4,494,210, Cl. 364-567.000.

Miller, Laurence L., to TRW Inc. Variable displacement motor. 4,493,622, Cl. 418-57.000.

Miller, Steven R.: *See*—
White, Allan E.; Coleman, David E.; and Miller, Steven R., 4,493,651, Cl. 434-188.000.

Mimura, Yoshiki: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
Beck, Warren R.; and Castle, Richard B., 4,493,875, Cl. 428-403.000.
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Sweeny, Norman P.; Relyea, Keith E.; and Brustad, Wayne L., 4,493,869, Cl. 428-201.000.

Minolta Camera Kabushiki Kaisha: *See*—
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Kudo, Yoshinobu, 4,493,536, Cl. 350-462.000.

Miranti, Joseph P., Jr., to Dayco Corporation. Belt construction, transverse belt element therefor and method of making the same. 4,493,679, Cl. 474-201.000.

Mirsky, Saul: *See*—
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Mistry, Kantilal, to Blonder-Tongue Laboratories, Inc. Method of and apparatus for scrambled television program addressable subscription selection and decoding. 4,494,142, Cl. 358-118.000.

Mitchell, Albert W., to Emerson Electric Co. Apparatus for cutting vegetation. 4,493,151, Cl. 30-276.000.

Mitchell, John D.; and Michel, Stephen, to Eastman Kodak Company. Electrophotographic method for producing black and color separation images. 4,493,881, Cl. 430-42.000.

Mitsubishi Chemical Industries, Ltd.: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Kajiyama, Ryuichi, 4,493,399, Cl. 187-29.00R.
Nawa, Akiyoshi; and Shimizu, Takao, 4,493,971, Cl. 219-137.520.
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Yukimoto, Yoshinori; and Mitsui, Kotaro, 4,493,941, Cl. 136-255.000.

Mitsuboshi Belting Ltd.: *See*—
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Mitsubushi Petrochemical Co., Ltd.: *See*—
Yazaki, Takao; and Noro, Masataka, 4,493,867, Cl. 428-161.000.

Mitsui, Kotaro: *See*—
Yukimoto, Yoshinori; and Mitsui, Kotaro, 4,493,941, Cl. 136-255.000.

Mittelmann, Gerhard J.; and Liebherr, Ricardo W., to Schweizerische Aluminium AG (Swiss Aluminium Ltd.). Freight container, in particular for air freight. 4,493,428, Cl. 220-1.500.

Mittelsteadt, Robert A.; and Machesney, Gregory W., to Micro-Quartz Technology Corp. Ceramic blinders for a microwave oven quartz lamp. 4,493,960, Cl. 219-10.55B.

Miura, Fukushiro. Electric rerailer for a model railway. 4,493,265, Cl. 104-269.000.

Miyashiro, Yutaka; Ogawa, Masao; Yamazaki, Yoshio; and Igarasi, Seizi, to Takeda Chemical Industries, Ltd. Polysaccharide beads. 4,493,894, Cl. 435-178.000.

Mizuno, Katsuya: *See*—
Ai, Minoru; Manabe, Akira; Igarashi, Yoshimasa; and Mizuno, Katsuya, 4,493,644, Cl. 433-75.000.

Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, to Taisho Pharmaceutical Co., Ltd.; and Green Cross Corporation, The. Fat emulsion containing prostaglandin E_1 and method for production thereof. 4,493,847, Cl. 424-317.000.

Mnekin, Ravil V.: *See*—
Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., 4,493,213, Cl. 73-664.000.

Mobay Chemical Corporation: *See*—
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Mobil Oil Corporation: *See*—
Kresge, Charles T.; Krishnamurthy, Sowmithri; and McHale, William D., 4,493,764, Cl. 208-138.000.
Odeh, Aziz S.; and Dotson, Billy J., 4,493,369, Cl. 166-261.000.
Prader, Randolph D.; Benoit, Gordon L.; and Maddock, Robert T., 4,493,419, Cl. 206-554.000.
Rudnick, Leslie R., 4,493,762, Cl. 208-11.00R.
Moeschlin, Lars F.: *See*—
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Moffatt, John G.: *See*—
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Mohasco Corporation: *See*—
Holobaugh, Raymond E., 4,493,469, Cl. 248-406.100.
Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl F., to Dragerwerk Aktiengesellschaft. Locking mechanism for use with two anesthetic evaporators. 4,493,318, Cl. 128-200.190.
Moilliet, Guy, to UTB Umwelttechnik Buchs AG. Method and system of generating heat by biological decomposition of organic refuse. 4,493,770, Cl. 210-603.000.
Moller, Hinrich; Wallat, Siegfried; Bartnik, Friedhelm; and Pittermann, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Topical cosmetic preparations for the treatment of oily hair and seborrheic skin. 4,493,823, Cl. 424-70.000.
Molyneux-Berry, Robert B., to Marconi Company Limited, The. Inductor. 4,494,167, Cl. 361-270.000.
Monsanto Company: *See*—
Goffe, Randal A., 4,493,629, Cl. 425-192.00S.
Goodin, Richard D.; and Chupp, John P., 4,493,755, Cl. 204-73.00R.
Trivette, Chester D., Jr., 4,493,925, Cl. 525-353.000.
Montegari, Frank A., to International Business Machines Corporation. Complementary decode circuit. 4,494,017, Cl. 307-463.000.
Monteyne, Guido. Conveyor belt for transporting slag material from a filtering apparatus. 4,493,767, Cl. 210-236.000.
Montgomery, John R.: *See*—
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Montgomery, Lawrence J.: *See*—
Niethammer, Heinz K.; and Montgomery, Lawrence J., 4,493,116, Cl. 2-69.000.
Moon, Michael L., to Maysteel Corporation. Induction fluid supply unit for exhaust hood apparatus. 4,493,312, Cl. 126-299.00D.
Moon, Sang H.; Park, Jae M.; and Suh, Sung S., to Korea Advanced Institute of Science and Technology. Fertilizer product with sustained action and process therefor. 4,493,725, Cl. 71-62.000.
Moore, James I.; and Van Huis, Philip J., to Ex-Cell-O Corporation. Programmable adaptive control method and system for die-casting machine. 4,493,362, Cl. 164-457.000.
Moore, Larry A.; and Walker, John S., to Motorola, Inc. Self-erecting composite antenna structure. 4,494,123, Cl. 343-900.000.
Moore, Paul A.: *See*—
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Moore, Ronald D.: *See*—
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More, Henry S.: *See*—
Jeter, John D.; and More, Henry S., 4,494,072, Cl. 324-347.000.
Moretti, Alfred, to United States of America, Energy. Radio frequency quadrupole resonator for linear accelerator. 4,494,040, Cl. 315-5.410.
Morgan, George J., to Stauffer Chemical Company. Pumping apparatus. 4,493,609, Cl. 415-20.000.
Mori, Keiji: *See*—
Nagata, Kazuhisa; Mori, Keiji; and Ogasawara, Asao, 4,493,507, Cl. 296-216.000.
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Morrell, David J.; DeVault, Donald G.; and Sands, William K., Jr. Pipe measuring method and apparatus. 4,494,224, Cl. 367-2.000.
Morris, David L., to Miles Laboratories, Inc. Activated apoglucose oxidase and its use in specific binding assays. 4,493,890, Cl. 435-7.000.
Morrison-Knudsen Co., Inc.: *See*—
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Morse, William C.; and Phaneuf, John B., to AT&T Technologies, Inc. Thin lead suspension for a piezoelectric resonator. 4,494,033, Cl. 310-352.000.
Motorola, Inc.: *See*—
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Garay, Oscar M., 4,494,120, Cl. 343-702.000.
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Groth, Edward J., Jr., 4,494,238, Cl. 375-1.000.
Moore, Larry A.; and Walker, John S., 4,494,123, Cl. 343-900.000.
Popek, Marc H.; and Suarez, Jose I., 4,494,090, Cl. 332-16.00T.
Stengel, Robert E.; and Nejdl, Charles W., 4,494,100, Cl. 336-200.000.
Mount, James: *See*—
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Moussie, Michel, to U.S. Philips Corporation. Programmable read only memory cell having an electrically destructible programmation element integrally formed with a junction diode. 4,494,135, Cl. 357-59.000.
Mueller, Richard J.: *See*—
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Muellner, William C., to Perkin-Elmer Corporation, The. Variable gain amplifier. 4,494,212, Cl. 364-571.000.
Muhl, Andrew H. Flow controlled electrode type liquid heater. 4,493,973, Cl. 219-286.000.
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Muller, Dietmar; Schubert, Hiltmar; and Krohnert, Rudolf, to Fraunhofer-Gesellschaft Zur Forderung der angewandten Forschung e.V. Apparatus for dewatering and plastifying mixtures for the manufacture of explosives. 4,493,630, Cl. 425-203.000.
Muller, Jurgen: *See*—
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Munchmeyer, Dietrich: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; Munchmeyer, Dietrich; Betz, Hans; and Heuberger, Anton, 4,493,753, Cl. 204-9.000.
Munzel, Klaus, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Control circuit for igniting a low-ohm ignition capsule. 4,493,259, Cl. 102-218.000.
Mupac Corporation: *See*—
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Murrin, Byran; Willis, Robert; and Page, Jeffrey, to OMI International Corporation. Anode structure for a plating cell. 4,493,758, Cl. 204-224.00R.
Musselmann, Walter; Kinzler, Herbert; and Tra, Josef, to J. M. Voith GmbH. Rotating sorter for fiber material suspensions. 4,493,766, Cl. 209-362.000.
Musto, Richard L.; and Kai, Norichika, to Combustion Engineering, Inc. Direct pulverized fuel fired system. 4,493,269, Cl. 110-106.000.
Mutschler, Otto. Releasable protective holder for a writing implement. 4,493,575, Cl. 401-195.000.
MZW Maschinenfabrik Zuckermann Pachtgesellschaft mbH: *See*—
Schmidt, Erich, 4,493,351, Cl. 144-3.00R.
Nadas, Julius: *See*—
Sander, Nils B. L.; and Nadas, Julius, 4,493,401, Cl. 188-199.000.
Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Damper disc. 4,493,408, Cl. 192-106.200.
Nagano, Teruo; and Nagashima, Akira, to Fuji Photo Film Co., Ltd. Light-sensitive composition. 4,493,884, Cl. 430-192.000.
Nagaoka, Miyuki: *See*—
Kume, Nobuyuki; Yoshino, Harumi; and Nagaoka, Miyuki, 4,494,168, Cl. 361-273.000.
Nagaoka, Satoshi: *See*—
Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,493,889, Cl. 430-572.000.
Nagashima, Akira; and Saito, Yasuo, to Kioritz Corporation. Emergency braking device for chain saw. 4,493,400, Cl. 188-77.00W.
Nagashima, Akira: *See*—
Nagano, Teruo; and Nagashima, Akira, 4,493,884, Cl. 430-192.000.
Nagata, Kazuhisa; Mori, Keiji; and Ogasawara, Asao, to Aisin Seiki Kabushiki Kaisha. Tilting type sunroof. 4,493,507, Cl. 296-216.000.
Nagel, Dietmar: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Avi, 4,493,671, Cl. 446-464.000.
Nagel, Gregory L.: *See*—
Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., 4,493,965, Cl. 219-109.000.
Nagy, Jozsef: *See*—
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.

Naiff, Kenneth L., to General Instrument Corporation. Read only memory using series connected depletion transistors as bus lines. 4,494,218, Cl. 365-104.000.
Naimpally, Saiprasad V.; and Tallant, James C., II, to RCA Corporation. Wideband kinescope driver amplifier. 4,494,146, Cl. 358-184.000.
Naito, Takeshi; Masamoto, Junzo; Iwaisako, Toshiyuki; and Matsuzaki, Kazuhiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for recovering trioxane by plural distillation. 4,493,752, Cl. 203-71.000.
Nakagawa, Akira: *See*—
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, 4,493,845, Cl. 424-279.000.
Nakagawa, Hisao: *See*—
Kishi, Ichiro; and Nakagawa, Hisao, 4,493,223, Cl. 74-371.000.
Nakagawa, Junkichi: *See*—
Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,493,530, Cl. 350-96.340.
Nakaguchi, Osamu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.
Nakahashi, Kenichi, to Olympus Optical Co., Ltd. Objective lens system for endoscopes. 4,493,537, Cl. 350-469.000.
Nakajima, Tetsuo; and Kumata, Hirotaka, to Honda Giken Kogyo Kabushiki Kaisha. Temperature measuring device for internal-combustion engine. 4,493,304, Cl. 123-479.000.
Nakamura, Hideo: *See*—
Noguchi, Kouki; Tsunehiro, Takashi; and Nakamura, Hideo, 4,494,195, Cl. 364-200.000.
Nakamura, Kazuo: *See*—
Kawahara, Hiroshi; and Nakamura, Kazuo, 4,493,569, Cl. 400-144.200.
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi-type carburetor. 4,493,804, Cl. 261-44.00C.
Nakamura, Toshiaki: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.
Nakane, Keiichi; Kamiuchi, Toshiro; and Nakanishi, Hiroaki, to Hitachi, Ltd. Method of processing an operating system in a multi-processor system. 4,494,188, Cl. 364-200.000.
Nakanishi Dental Mfg., Co., Ltd.: *See*—
Nakanishi, Takasuke, 4,493,645, Cl. 433-127.000.
Nakanishi, Hiroaki: *See*—
Nakane, Keiichi; Kamiuchi, Toshiro; and Nakanishi, Hiroaki, 4,494,188, Cl. 364-200.000.
Nakanishi, Takasuke, to Nakanishi Dental Mfg., Co., Ltd. Device for opening and closing a chuck for a dental handpiece. 4,493,645, Cl. 433-127.000.
Nakuru Inc.: *See*—
Ono, Osamu, 4,493,152, Cl. 33-25.00R.
Nall, Lawson H., to TRI Tool, Inc. Adjustable mandrel for portable lathe. 4,493,232, Cl. 82-4.00C.
Namiki, Takayuki: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,493,832, Cl. 424-199.000.
Nannini, Alessandro: *See*—
Pagano, Roberto; and Nannini, Alessandro, 4,493,390, Cl. 181-204.000.
Napolitano, Pellegrino E., to Hudson Engineering Company. Tee-type valve for self-priming pump system. 4,493,607, Cl. 415-11.000.
Nappi Trucking Corp.: *See*—
Karlik, Richard L., 4,493,491, Cl. 280-402.000.
Nara, Yasuaki: *See*—
Hibino, Yozo; Kamejima, Kohji; and Nara, Yasuaki, 4,493,192, Cl. 62-141.000.
Nason, George F., III: *See*—
Fine, Richard A.; and Nason, George F., III, 4,493,551, Cl. 355-22.000.
National Research Development Corp.: *See*—
Stangroom, James E., 4,493,615, Cl. 417-48.000.
Nauchno-Issledovatelsky Institut Introskopii: *See*—
Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., 4,493,213, Cl. 73-664.000.
Nautilus Sports/Medical Industries, Inc.: *See*—
Jones, Arthur A., 4,493,485, Cl. 272-126.000.
Nawa, Akiyoshi; and Shimizu, Takao, to Mitsubishi Denki Kabushiki Kaisha. Hot wire type electric arc welding torch. 4,493,971, Cl. 219-137.520.
Nayak, Ashok L.; and Spremulli, Paul F., to Corning Glass Works. Mixing apparatus. 4,493,557, Cl. 366-300.000.
NCR Canada Ltd. - NCR Canada Ltee: *See*—
Vyas, Arvindkumar C., 4,493,253, Cl. 101-93.030.
NCR Corporation: *See*—
Bader, Leonhard; Hermann, Ferdinand; Ruprich, Wilhelm; and Winter, Hermann, 4,493,137, Cl. 29-25.350.
Gunderson, Robert O.; Kocol, James C.; and Schuck, David B., 4,494,185, Cl. 364-200.000.
NEC Corporation: *See*—
Takekida, Yoshisuke, 4,493,550, Cl. 355-10.000.
Necchi S.p.A.: *See*—
Bianchi, Nereo, 4,493,280, Cl. 112-260.000.
Nedelec, Lucien; Pierdet, Andre ; and Fauveau, Patrick, to Uclaf, Roussel. 9-Oxalysergic acid derivatives and uses thereof. 4,493,836, Cl. 424-248.400.
Nejdl, Charles W.: *See*—
Stengel, Robert E.; and Nejdl, Charles W., 4,494,100, Cl. 336-200.000.
Nelson, Arthur R., to Aetna Telecommunications Laboratories. Fiber optic mass sensor. 4,493,212, Cl. 73-517.00R.
Nelson, Dale K.: *See*—
Mathison, Allen D.; Nelson, Dale K.; and Cherne, Lloyd G., 4,493,344, Cl. 138-89.000.
Nelson, Gregory R.: *See*—
Reed, Kenneth E.; Mason, Bradley; Mason, Jeff; and Nelson, Gregory R., 4,493,316, Cl. 128-80.00C.
Nelson, James C., to Chandler Evans Inc. Oil lubricated main drive shaft for fuel pump. 4,493,623, Cl. 418-94.000.
Nelson, Robert B., to Maytag Company, The. Double actuation coin slide system. 4,493,410, Cl. 194-1.00G.
Nestler, Gerhard: *See*—
Merger, Franz; and Nestler, Gerhard, 4,493,801, Cl. 260-465.600.
Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., to Syntex (U.S.A.) Inc. Synthetic peptide sequences useful in biological and pharmaceutical applications and methods of manufacture. 4,493,795, Cl. 260-112.50E.
Neuhierl, Hermann. Motorized toy. 4,493,669, Cl. 446-103.000.
Neukermans, Armand P., to Hewlett-Packard Company. Electron beam window. 4,494,036, Cl. 313-420.000.
Neurometrics, Inc.: *See*—
Bergelson, Michael; Fridman, Jacob; and John, Erwin R., 4,493,327, Cl. 128-731.000.
Nevo-Hacohen, Jacob I. Conveyor elevator apparatus. 4,493,414, Cl. 198-800.000.
Newman, Seymour: *See*—
Meyer, Fred J.; and Newman, Seymour, 4,493,918, Cl. 524-451.000.
Newton, David F.; and Thompson, David J., to Imperial Chemical Industries PLC. Anthraquinone compounds. 4,493,785, Cl. 252-299.100.
Newton, Paul P., to Warner Electric Brake & Clutch Company. Armature assembly for an electromagnetic clutch. 4,493,407, Cl. 192-84.00C.
Nichol, Bud. Electrified fence gate. 4,493,480, Cl. 256-10.000.
Nicholson, George R.: *See*—
Stewart, David E.; and Nicholson, George R., 4,493,229, Cl. 76-107.00A.
Nieberl, Bruno: *See*—
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, 4,494,101, Cl. 336-210.000.
Niemiro, Josef W.; and Skipor, Eugene, to Rockwell International Corporation. Cam activated anti-dog-ear device. 4,493,690, Cl. 493-444.000.
Niephaus, Dieter: *See*—
Beaujean, Holger; Kamphausen, Willi; Niephaus, Dieter; and Nommensen, Ove, 4,493,434, Cl. 222-3.000.
Niethammer, Heinz K.; and Montgomery, Lawrence J., to Kimberly-Clark Corporation. Method for manufacturing sleeved garments. 4,493,116, Cl. 2-69.000.
Niggemann, Richard E.: *See*—
Bland, Timothy J.; and Niggemann, Richard E., 4,494,171, Cl. 361-386.000.
Niki, Haruo: *See*—
Fukaya, Hirokazu; and Niki, Haruo, 4,494,077, Cl. 330-295.000.
Nikkanen, John P.; and Griffin, James G., to United Technologies Corporation. Pressurized nacelle compartment for active clearance controlled gas turbine engines. 4,493,184, Cl. 60-204.000.
Nikutta, Wolfgang: *See*—
Frieling, Focko; Michael, Ewald; and Nikutta, Wolfgang, 4,494,015, Cl. 307-268.000.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,493,633, Cl. 425-525.000.
Nilsson, Weimar, to Huskvarna Transtortkonstruktionar A.B. Locking means, particularly for truck platform flaps, and the like. 4,493,133, Cl. 24-68.00T.
Nippon Electric Co., Ltd.: *See*—
Fukaya, Hirokazu; and Niki, Haruo, 4,494,077, Cl. 330-295.000.
Nippon Kogaku K.K.: *See*—
Uematsu, Kimio, 4,493,544, Cl. 354-246.000.
Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,493,943, Cl. 174-25.00C.
Nippon Seiko Kabushiki Kaisha: *See*—
Osawa, Hiroyuki; and Ishida, Yasutaka, 4,493,513, Cl. 384-533.000.
Nippon Steel Corporation: *See*—
Dairiki, Osamu; Ookuma, Humio; and Asano, Hiroyuki, 4,494,205, Cl. 364-472.000.
Fujiwara, Koichi; Sakai, Tomohiko; Yamada, Yoneo; and Higashine, Kazutaka, 4,493,739, Cl. 148-111.000.
Nippondenso Co., Ltd.: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.
Nishigaki, Masahiko: *See*—
Hirobe, Kazushi; Tonoki, Satoshi; and Nishigaki, Masahiko, 4,493,913, Cl. 523-205.000.

Nishijima, Hideo; Sera, Katsumi; Fukushima, Isao; and Kobori, Yasunori, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Motor driving circuit. 4,494,056, Cl. 318-269.000.
Nishikawa, Akio: *See*—
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.
Nishino, Atsushi; Ikeda, Masaki; Kimura, Kunio; and Oyabu, Hajime, to Matsushita Electric Industrial Company, Limited. Low melting enamel frits. 4,493,900, Cl. 501-26.000.
Nishiyama, Kunio: *See*—
Yamawaki, Takeshi; and Nishiyama, Kunio, 4,493,505, Cl. 296-63.000.
Nishizawa, Hiroshi; Sato, Tadayuki; and Ishikawa, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for insulating slots in rotors of electrical rotating machines. 4,493,858, Cl. 427-104.000.
Nissan Industrial Equipment Co.: *See*—
Maes, George L., 4,493,397, Cl. 187-9.00E.
Nissan Motor Company, Limited: *See*—
Horibe, Osamu, 4,493,243, Cl. 91-369.00B.
Kawamura, Yoshihisa, 4,493,302, Cl. 123-357.000.
Umemura, Yukio, 4,493,294, Cl. 123-41.330.
NJM, Inc.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,493,744, Cl. 156-568.000.
Nodet-Gougis: *See*—
Gauchet, Yves M. A.; and Paillaud, Pierre G., 4,493,273, Cl. 111-86.000.
Noel, Stan L., to Ampex Corporation. Overload protection device. 4,494,164, Cl. 361-101.000.
Noguchi, Kouki; Tsunehiro, Takashi; and Nakamura, Hideo, to Hitachi, Ltd. Microinstruction controlled data processor. 4,494,195, Cl. 364-200.000.
Noji, Tasuku; and Hiyama, Torao, to Alps Electric Co., Ltd. High frequency circuit shielding structure having tuning coils double shielded. 4,494,095, Cl. 334-85.000.
Nommensen, Ove: *See*—
Beaujean, Holger; Kamphausen, Willi; Niephaus, Dieter; and Nommensen, Ove, 4,493,434, Cl. 222-3.000.
Nomura, Tutomu: *See*—
Kubo, Osamu; Ido, Tadashi; Nomura, Tutomu; and Maeda, Tatsumi, 4,493,874, Cl. 428-403.000.
Nonomura, Kinzo; Watanabe, Masanori; and Takesako, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Electrode construction and method of making the same. 4,493,666, Cl. 445-24.000.
Noro, Masataka: *See*—
Yazaki, Takao; and Noro, Masataka, 4,493,867, Cl. 428-161.000.
Norris, Allyn P.: *See*—
Johnson, Richard C.; and Norris, Allyn P., 4,493,206, Cl. 73-7.000.
Norsk Hydro a.s.: *See*—
Gronnerud, Rolf; and Boe, Einar, 4,493,368, Cl. 165-159.000.
Northern Telecom Limited: *See*—
Bennett, Jeffrey H., 4,494,082, Cl. 333-28.00R.
Holmes, Edward S. B., 4,494,104, Cl. 337-403.000.
Retallack, Laurence J.; and Reedyk, Cornelis W., 4,493,949, Cl. 179-18.0BC.
Springthorpe, Anthony J., 4,493,287, Cl. 118-719.000.
Norton, Jeffery R., to Stresau Laboratory, Inc. Parachute line cutting device. 4,493,240, Cl. 89-1.140.
Novotny, Bernd: *See*—
Freyberger, Laurin C.; and Novotny, Bernd, 4,494,137, Cl. 358-27.000.
Nozaki, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Auxiliary radially shifting mechanism for vanes in a pump of the vane type. 4,493,626, Cl. 418-260.000.
Nubs Nob, Inc.: *See*—
Dilworth, James L.; and Brinks, Robert J., 4,493,457, Cl. 239-25.000.
Nunes, Maurice: *See*—
Hurley, James R.; Searight, Edward F.; and Nunes, Maurice, 4,493,308, Cl. 126-41.00R.
O & S Manufacturing Company: *See*—
Smith, Joseph E., Jr., 4,493,512, Cl. 308-2.00R.
Occidental Chemical Corporation: *See*—
Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., 4,493,895, Cl. 435-262.000.
Odeh, Aziz S.; and Dotson, Billy J., to Mobil Oil Corporation. Method of improved oil recovery by simultaneous injection of water with an in-situ combustion process. 4,493,369, Cl. 166-261.000.
Odermann, Charles R., to Singer Company, The. Combination needle and accessory driving stud. 4,493,279, Cl. 112-220.000.
Ogasawara, Asao: *See*—
Nagata, Kazuhisa; Mori, Keiji; and Ogasawara, Asao, 4,493,507, Cl. 296-216.000.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Tape cassette. 4,494,161, Cl. 360-132.000.
Ogata, Tomohiro: *See*—
Takahashi, Hiroyuki; and Ogata, Tomohiro, 4,493,360, Cl. 164-286.000.
Ogawa, Kimio: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,494,161, Cl. 360-132.000.
Ogawa, Masao: *See*—
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Ogawa, Shunichi: *See*—
Hashimoto, Masanori; and Ogawa, Shunichi, 4,493,573, Cl. 400-647.100.
O'Hanlon, Thomas A.: *See*—
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,493,379, Cl. 175-57.000.
Ohayon, Gerard; Reverchon, Bernard; Tourre, Bernard; and Vigier, Serge, to Lafarge Conseils et Etudes. Coal or multifuel burner. 4,493,271, Cl. 110-262.000.
Ohki, Nobutaka: *See*—
Endo, Katsusuke; Kato, Eiichi; Ohki, Nobutaka; and Ishikawa, Takatoshi, 4,493,888, Cl. 430-405.000.
Ohma, Toshio, to Showa Manufacturing Co., Ltd. Front fork for cycle. 4,493,490, Cl. 280-276.000.
Ohmori, Takashi: *See*—
Kurata, Masami; and Ohmori, Takashi, 4,494,152, Cl. 358-293.000.
Ohmura, Hiroshi; Kohno, Atsuo; Shiiba, Minoru; and Tanaka, Tsutomu, to Fuji Photo Film Co., Ltd. Photographic camera with handle grip. 4,493,542, Cl. 354-82.000.
Ohnishi, Shunsaku: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.
Ohta, Hiroshi, to Rikagaku Kenkyusho. Josephson junction element and method of making the same. 4,494,131, Cl. 357-5.000.
Ohyama, Tadashi, to Aisin Seiki Kabushiki Kaisha. Electromagnetic valve unit. 4,493,474, Cl. 251-129.000.
Okada, Minoru, to Santrade Ltd. Milling cutter. 4,493,594, Cl. 407-41.000.
Okada, Satoshi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.
Okamoto, Hiroyuki: *See*—
Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, 4,493,847, Cl. 424-317.000.
Okazaki, Masaki: *See*—
Mihara, Yuji; Nagaoka, Satoshi; and Okazaki, Masaki, 4,493,889, Cl. 430-572.000.
Okinaka, Yutaka: *See*—
Abys, Joseph A.; and Okinaka, Yutaka, 4,493,754, Cl. 204-47.000.
Oku, Teruo: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,493,832, Cl. 424-199.000.
Okui, Isamu: *See*—
Yoshihisa, Kozo; and Okui, Isamu, 4,494,075, Cl. 330-254.000.
Oldland, Sidney R. D.: *See*—
Edgerley, Peter G.; and Oldland, Sidney R. D., 4,493,871, Cl. 428-308.400.
Oliva, Rudolf; and Schmidt, K. Ulf, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e. V. Device operating by means of pyrotechnic charges for releasing joints subject to load. 4,493,241, Cl. 89-1.140.
Olmsted, James F.; Webster, Sherwood F.; and Heise, Richard L. Thermodynamic conditioning of air or any other gas to increase the operating efficiency of diverse energy consuming systems. 4,493,750, Cl. 159-48.100.
Olsen, Arthur M.: *See*—
Bayer, Stephen J.; and Olsen, Arthur M., 4,494,183, Cl. 364-154.000.
Olsen, Kolbjorn. Adapter plug for current supply rail systems. 4,493,519, Cl. 339-75.00M.
Olsen, Ronald H.: *See*—
Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., 4,493,895, Cl. 435-262.000.
Olympus Optical Co., Ltd.: *See*—
Fujibayashi, Kenji, 4,494,158, Cl. 360-69.000.
Kimura, Kenji, 4,494,225, Cl. 369-44.000.
Nakahashi, Kenichi, 4,493,537, Cl. 350-469.000.
Tabara, Takashi, 4,493,897, Cl. 436-47.000.
O'Malley, Michael P.; and Thibault, Alfred R., to International Packaging Systems Inc. Apparatus for molding foam cushion packaging. 4,493,627, Cl. 425-89.000.
Omega SA: *See*—
Gagnebin, Gaston, 4,493,562, Cl. 368-294.000.
OMI International Corporation: *See*—
Murrin, Byran; Willis, Robert; and Page, Jeffrey, 4,493,758, Cl. 204-224.00R.
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, to Kitasato Kenkyusho. Antibiotic AM-3603. 4,493,845, Cl. 424-279.000.
Ono, George Y.: *See*—
Kubert, Vincent T.; Frampton, John C.; and Ono, George Y., 4,493,257, Cl. 101-349.000.
Ono, Hiroyuki, to Yamamura Glass Co., Ltd. Method of producing glass bottles. 4,493,722, Cl. 65-30.140.
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; Sami, Shunsuke; Kojima, Atsuyuki; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Bicyclooctane derivatives. 4,493,846, Cl. 424-308.000.
Ono, Osamu, to Nakuru Inc. Lettering machine. 4,493,152, Cl. 33-25.00R.
Ono, Shigetoshi: *See*—
Fujita, Shinsaku; Maekawa, Yukio; and Ono, Shigetoshi, 4,493,885, Cl. 430-223.000.

Ookuma, Humio: *See*—
Dairiki, Osamu; Ookuma, Humio; and Asano, Hiroyuki, 4,494,205, Cl. 364-472.000.
Orita, Ryozo: *See*—
Shimamoto, Kunihiro; Hatanaka, Hiroshi; Seki, Shinichiro; and Orita, Ryozo, 4,493,938, Cl. 568-62.000.
Ortega, Francis, to U.S. Philips Corporation. Heating device with heat storage. 4,493,365, Cl. 165-10.00A.
Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. Preparation of 1H-pyrrol-2-acetic acid esters. 4,493,935, Cl. 548-562.000.
Ortloff, John E., to Exxon Production Research Co. Combination mooring system. 4,493,282, Cl. 114-230.000.
Osaka Gas Company Limited: *See*—
Ito, Hirosato; and Takada, Daizo, 4,493,635, Cl. 431-90.000.
Osawa, Hiroyuki; and Ishida, Yasutaka, to Nippon Seiko Kabushiki Kaisha. Bearing cage for retaining rolling elements. 4,493,513, Cl. 384-533.000.
Ota, Akio: *See*—
Kajikawa, Masauemon; and Ota, Akio, 4,493,381, Cl. 175-107.000.
Ota, Yozo: *See*—
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Otomo, Susumu: *See*—
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Otto, Charles W., to General Electric Company. Dynamoelectric machine with self-adjusting bearing. 4,494,027, Cl. 310-89.000.
Outboard Marine Corporation: *See*—
Wick, Gerald H., 4,493,180, Cl. 56-11.300.
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Owens-Corning Fiberglas Corporation: *See*—
Green, William A.; Godfrey, Joe E.; and Pietsch, David S., 4,493,464, Cl. 242-170.000.
Haynes, Eugene M., 4,493,367, Cl. 165-72.000.
Owens-Illinois, Inc.: *See*—
Wedding, Donald K.; Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard J., 4,494,038, Cl. 313-587.000.
Owlett, David D., to GTE Communications Systems Corporation. Lockable tuning mechanism with reduced backlash. 4,494,093, Cl. 333-232.000.
OXIMETRIX, Inc.: *See*—
Beard, Robert W.; and Kirk, Russell F., 4,493,704, Cl. 604-154.000.
Oyabu, Hajime: *See*—
Nishino, Atsushi; Ikeda, Masaki; Kimura, Kunio; and Oyabu, Hajime, 4,493,900, Cl. 501-26.000.
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P.A.S.T. Corporation: *See*—
Maier, Bruce R.; and Flannery, Lincoln R., 4,493,115, Cl. 2-2.000.
Pagano, Roberto; and Nannini, Alessandro, to Fiat Auto S.p.A. Apparatus for the combined production of electrical energy and heat. 4,493,390, Cl. 181-204.000.
Page, Jeffrey: *See*—
Murrin, Byran; Willis, Robert; and Page, Jeffrey, 4,493,758, Cl. 204-224.00R.
Pagella, Piergiuseppe: *See*—
Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, 4,493,829, Cl. 424-177.000.
Paillaud, Pierre G.: *See*—
Gauchet, Yves M. A.; and Paillaud, Pierre G., 4,493,273, Cl. 111-86.000.
Pall Corporation: *See*—
Degen, Peter J.; and Gsell, Thomas C., 4,493,756, Cl. 204-141.500.
Palluel, Pierre; and Shroff, Arvind, to Thomson-CSF. Thermoelectric cathode for a hyperfrequency valve and valves incorporating such cathodes. 4,494,035, Cl. 313-346.00R.
Pan, Robert B.: *See*—
Radd, Fred J.; Scott, James B.; and Pan, Robert B., 4,493,372, Cl. 166-285.000.
Panaia, David J.; and Lovell, Walter C. Pressure control wheel chair seat. 4,493,488, Cl. 280-42.000.
Panas, William R.: *See*—
Jarosz, John M.; and Panas, William R., 4,494,103, Cl. 337-282.000.
Pannell, Richard B.: *See*—
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Pantasote Inc.: *See*—
Coppola, Joseph C., Jr., 4,493,175, Cl. 52-410.000.
Par-Way Manufacturing Co.: *See*—
Hanson, Harold W., Jr., 4,493,442, Cl. 222-241.000.
Park, Jae M.: *See*—
Moon, Sang H.; Park, Jae M.; and Suh, Sung S., 4,493,725, Cl. 71-62.000.
Parkes, Larry S.: *See*—
Godfrey, Noel R.; Parkes, Larry S.; and Treacy, Richard H., 4,494,050, Cl. 318-158.000.
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Zanno, Paul R.; Parliment, Thomas H.; Soukup, Robert J.; and McNaught, Richard P., 4,493,852, Cl. 426-535.000.
Paschedag, Hansjoachim; Mulhaupt, Bruno; and Kubr, Vaclav, to Sulzer-Escher Wyss Ltd. Twin pusher centrifuge. 4,493,769, Cl. 210-360.200.
Paschedag, Hansjoachim: *See*—
Kubr, Vaclav; Mulhaupt, Bruno; and Paschedag, Hansjoachim, 4,493,768, Cl. 210-360.200.
Pascual, Gabriel E. Taper gauge device for hair clippers. 4,493,154, Cl. 33-185.00R.
Pastorius, Walter J.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,493,554, Cl. 356-241.000.
Patel, Arvind M., to International Business Machines Corporation. On-the-fly multibyte error correcting system. 4,494,234, Cl. 371-38.000.
Patton, Bennie N. Wind-driven generator. 4,494,008, Cl. 290-44.000.
Paul, Duane B., to General Electric Company. Surge control in compressor. 4,493,608, Cl. 415-11.000.
Paul, Jurgen; Braatz, Andreas; and Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Hydrodynamic device. 4,493,293, Cl. 123-41.120.
Paul Wurth S.A.: *See*—
Legille, Edouard; and Mailliet, Pierre, 4,493,600, Cl. 414-208.000.
Paule, Kurt: *See*—
Gunther, Klaus; Hornung, Friedrich; Paule, Kurt; and Schadlich, Fritz, 4,493,377, Cl. 173-170.000.
Pauze, Denis R.: *See*—
Keane, John J.; and Pauze, Denis R., 4,493,873, Cl. 428-372.000.
Pawlenko, Ivan: *See*—
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.
Payne, Thomas R.; and Schneider, David A., to General Electric Company. Power control arrangement for automatic surface unit. 4,493,980, Cl. 219-450.000.
Payne, Thomas R., to General Electric Company. Boil dry protection system for cooking appliance. 4,493,981, Cl. 219-450.000.
Payton, John L., to Codex Corporation. Modem end of message detector. 4,494,240, Cl. 375-75.000.
Pearson, Michael L.: *See*—
Winter, David C.; Pearson, Michael L.; and Long, John D., 4,493,375, Cl. 172-1.000.
Peck, Peter F., to United Kingdom Atomic Energy Authority. Detection of concealed materials. 4,494,001, Cl. 250-358.100.
Pedersen, Marvin A., to United States of America, Navy. Range clearance by enhancing oxidation of ferrous ordnance in-situ. 4,493,239, Cl. 89-1.130.
Peeters, Winfried L.; Ponjee, Johannes J.; and Martens, Jan W. D., to U.S. Philips Corporation. Optical recording element. 4,493,887, Cl. 430-275.000.
Peil, William: *See*—
Bitting, Ricky F.; Peil, William; and Brown, Thomas A., 4,494,055, Cl. 318-254.000.
Pellegrini, Gerald N. Electric power delivery system and method. 4,494,054, Cl. 318-254.000.
Pelletier, Joel A.; and Breuillard, Robert, to U.S. Philips Corporation. Analogue current switch bipolar injection technology. 4,494,014, Cl. 307-254.000.
Perepezko, John H.; and Wiley, John D., to Wisconsin Alumni Research Foundation. Semiconductor device having an amorphous metal layer contact. 4,494,136, Cl. 357-67.000.
Perkin-Elmer Corporation, The: *See*—
Muellner, William C., 4,494,212, Cl. 364-571.000.
Peronard, Pierre-Rene, to Dansk Svejsemaskine Fabrik A/S. Apparatus for positioning receptacles of ferromagnetic material and having a welding seam. 4,494,070, Cl. 324-208.000.
Persson, Anders: *See*—
Adolfsson, Morgan; Brogardh, Torgny; Ovren, Christer; and Persson, Anders, 4,493,995, Cl. 250-227.000.
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Andrione, Norbert; Peruzzi, Federigo; and Scandurra, Giancarlo, 4,493,226, Cl. 74-598.000.
Pesho, Stephen W.: *See*—
Buckner, Leonard; Foll, William A., Sr.; and Pesho, Stephen W., 4,493,178, Cl. 53-131.000.
Peters, Arthur, to Honeywell Information Systems Inc. FIFO buffer to cache memory. 4,494,190, Cl. 364-200.000.
Peters, James: *See*—
Snyder, Kenneth L., Jr.; and Peters, James, 4,493,777, Cl. 252-49.300.
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Sommer, Gordon M., 4,493,613, Cl. 417-15.000.
Petrzilka, Martin; Pracht, Inge; and Ruf, Urs, to Hoffmann-La Roche Inc. Immersion oil containing aliphatic thio compounds. 4,493,533, Cl. 350-418.000.
Petursson, Sigurdur G., to Waltec, Inc. Washerless faucet. 4,493,338, Cl. 137-454.200.
Peuzin, Jean C., to Commissariat a l'Energie Atomique. Pyroelectric detector. 4,493,563, Cl. 374-121.000.
Pews, Richard G., to Dow Chemical Company, The. Preparation of 2-alkylpyrimidines. 4,493,929, Cl. 544-242.000.
Phaneuf, John B.: *See*—
Morse, William C.; and Phaneuf, John B., 4,494,033, Cl. 310-352.000.

Pharmindustrie: *See*—
Champseix, Alain A.; and Le Fur, Gerard R., 4,493,838, Cl. 424-258.000.

Phillips, Edwin R.: *See*—
Kanamuller, Franz X.; and Phillips, Edwin R., 4,493,993, Cl. 250-222.100.

Phillips Petroleum Company: *See*—
Hogan, John P., 4,493,715, Cl. 55-68.000.
Stapp, Paul R.; and Chaney, Mary B., 4,493,370, Cl. 166-273.000.

Physics International Company: *See*—
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.

Piascinski, Joseph J.; Axelrod, Randolph H.; and Mount, James, to RCA Corporation. Method for combined baking-out and panel-sealing of a partially-assembled CRT. 4,493,668, Cl. 445-40.000.

Piatt, Michael J.; and Williams, Theodore F., to Eastman Kodak Company. Ink jet printer. 4,494,124, Cl. 346-1.100.

Piccolo, Dominic J.: *See*—
Carroll, Thomas J.; Rubin, Michael; Piccolo, Dominic J.; and Glass, Michael, 4,493,849, Cl. 426-3.000.

Piepers, Harry C., to Galentan, A.G. Device for applying blot-shaped coverings by electro-plating. 4,493,757, Cl. 204-206.000.

Pierce, Philip R.: *See*—
Callen, Patrick J.; and Pierce, Philip R., 4,494,063, Cl. 320-56.000.

Pierdet, Andre : *See*—
Nedelec, Lucien; Pierdet, Andre ; and Fauveau, Patrick, 4,493,836, Cl. 424-248.400.

Pierson, Jeanne: *See*—
Gordon, Lucas S.; and Pierson, Jeanne, 4,493,705, Cl. 604-122.000.

Pieters, Ferdinandus A., to Micropump Corporation. Grooved gear pump. 4,493,625, Cl. 418-126.000.

Pietsch, David S.: *See*—
Green, William A.; Godfrey, Joe E.; and Pietsch, David S., 4,493,464, Cl. 242-170.000.

Pilgram, Kurt H., to Shell Oil Company. Plant growth inhibiting oxazolyl-substituted triazinone and oxadiazinone derivatives, compositions, and method of use. 4,493,728, Cl. 71-92.000.

Pilkington Brothers P.L.C.: *See*—
Evason, John, 4,493,723, Cl. 65-114.000.

Pisani, Sergio C.: *See*—
Brembilla, Almiro; and Pisani, Sergio C., 4,493,160, Cl. 38-14.000.

Piscitelli, R. Amelia; Hemmer, Valentine J.; and Shepler, Eric F., to Bendix Corporation, The. Socket contact for electrical connectors. 4,493,527, Cl. 339-258.00R.

Pistor, Dieter; and Mankut, Ludwig, to Schering Aktiengesellschaft. Arrangement for opening and closing a cover of a transport and treatment container. 4,493,429, Cl. 220-211.000.

Pitney Bowes Inc.: *See*—
Clark, John I., 4,493,252, Cl. 101-71.000.
Toth, William D., 4,493,236, Cl. 83-440.100.

Pitschi, Franz X.: *See*—
Spinner, Georg; and Pitschi, Franz X., 4,494,094, Cl. 333-239.000.

Pittermann, Wolfgang: *See*—
Moller, Hinrich; Wallat, Siegfried; Bartnik, Friedhelm; and Pittermann, Wolfgang, 4,493,823, Cl. 424-70.000.

Plan Hold Corp.: *See*—
Matthews, Charles, 4,494,177, Cl. 362-402.000.

Platt, Kenneth B.; and Reed, David E., to Iowa State University Research Foundation. Purified and antigenically selective vaccines for domestic animals. 4,493,825, Cl. 424-88.000.

Plessey Incorporated: *See*—
Ledgerwood, Harry J., 4,493,447, Cl. 226-150.000.

PLM Aktiebolag: *See*—
Jakobsen, Kjell M.; Nilsson, Claes T.; and Larsson, Lars G., 4,493,633, Cl. 425-525.000.

Plummer, Ernest L., to FMC Corporation. Insecticidal 2,2'-bridged(1,1'-biphenyl)-3-ylmethyl carboxamides. 4,493,844, Cl. 424-275.000.

Pohl, Werner: *See*—
Ramlohr, Franz; Pohl, Werner; and Kolzer, Walter, 4,494,181, Cl. 363-63.000.

Polanco, Jose R.; and Spector, George. Kite reel. 4,493,461, Cl. 242-96.000.

Polaroid Corporation: *See*—
Cronin, David V., 4,493,546, Cl. 354-324.000.
Svatek, Thomas A., 4,494,148, Cl. 358-226.000.

Polizzi, Jerry: *See*—
Polk, Todd J.; and Polizzi, Jerry, 4,493,319, Cl. 128-303.00A.

Polk, Todd J.; and Polizzi, Jerry, to Cabot Medical Corporation. Ring applicator having floating inner tube. 4,493,319, Cl. 128-303.00A.

Pomponio, Daniel P., Sr., to Precision Automation Co., Inc. Liquid filling machine. 4,493,349, Cl. 141-59.000.

Ponjee, Johannes J.: *See*—
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Popek, Marc H.; and Suarez, Jose I., to Motorola, Inc. Frequency modulation system for a frequency synthesizer. 4,494,090, Cl. 332-16.00T.

Porenski, Harry S., Jr., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,493,331, Cl. 131-336.000.

Porter, George K., Jr., to Porter Instrument Company, Inc. Air valve for a breathing system. 4,493,339, Cl. 137-510.000.

Porter Instrument Company, Inc.: *See*—
Porter, George K., Jr., 4,493,339, Cl. 137-510.000.

Porter, Joseph W.: *See*—
Becker, Donald E.; Hayes, Alan C.; and Porter, Joseph W., 4,493,816, Cl. 422-143.000.

Posey, Robert G.: *See*—
Funderburk, F. Gene; Culbertson, E. C.; and Posey, Robert G., 4,493,872, Cl. 428-332.000.

Potter, John T., to Iquad Company Incorporated. Print guide mechanism. 4,493,571, Cl. 400-144.200.

PPG Industries, Inc.: *See*—
Krehnovi, Richard J., 4,493,412, Cl. 198-434.000.

Pracht, Inge: *See*—
Petrzilka, Martin; Pracht, Inge; and Ruf, Urs, 4,493,533, Cl. 350-418.000.

Prader, Randolph D.; Benoit, Gordon L.; and Maddock, Robert T., to Mobil Oil Corporation. Thermoplastic bag and bag pack. 4,493,419, Cl. 206-554.000.

Precision Automation Co., Inc.: *See*—
Pomponio, Daniel P., Sr., 4,493,349, Cl. 141-59.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf., GmbH & Co.: *See*—
Viebrantz, Hans-Joachim, 4,493,959, Cl. 200-340.000.

Pretorius, Rapha E.: *See*—
Yelland, Christopher P.; and Pretorius, Rapha E., 4,494,163, Cl. 361-56.000.

Prew, Stanley R., to Koppers Company, Inc. Method and apparatus for mixing particulate material. 4,493,556, Cl. 366-114.000.

Price, Norris. Tobacco stripper and grading machine. 4,493,330, Cl. 130-31.00R.

Prija, Pieter R., to U.S. Philips Corporation. High-frequency coil structure. 4,494,099, Cl. 335-299.000.

Prikhodko, Valery V.; and Kostyrkin, Boris V., to Proektno-Konstructorskoe Bjuro Elektrogidravliki Adademii Nauk Ukrainskoi SSR. Apparatus for electrohydroblasting trimming of castings. 4,493,961, Cl. 219-69.00R.

Prime Computer, Inc.: *See*—
Bahr, Richard G.; and Cohen, Paul B., 4,494,233, Cl. 370-86.000.

Proconics International, Inc.: *See*—
Foulke, Richard F.; and Lord, Steven M., 4,493,606, Cl. 414-787.000.

Procter & Gamble Company, The: *See*—
Cook, Thomas E.; and Dolle, Ernest W., 4,493,773, Cl. 252-8.800.
LaHann, Thomas R.; and Buckwalter, Brian L., 4,493,848, Cl. 424-324.000.

Procyk, Frank J.: *See*—
Dumbri, Austin C.; and Procyk, Frank J., 4,494,220, Cl. 365-200.000.

Product Research And Development: *See*—
Hartley, E. Dale, 4,493,435, Cl. 222-52.000.

Proektno-Konstructorskoe Bjuro Elektrogidravliki Adademii Nauk Ukrainskoi SSR: *See*—
Prikhodko, Valery V.; and Kostyrkin, Boris V., 4,493,961, Cl. 219-69.00R.

Proud, Joseph M.: *See*—
Budinger, A. Bowman; Byszewski, Wojciech W.; and Proud, Joseph M., 4,494,046, Cl. 315-260.000.

Pruett, Larry S. Adjustable thermostat valve system for automotive vehicles. 4,493,455, Cl. 236-34.500.

Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., to Diffracto. Method and apparatus for determining physical characteristics of objects and object surfaces. 4,493,554, Cl. 356-241.000.

PUR/ACC Corporation: *See*—
Lemmons, Joseph J., 4,493,348, Cl. 141-1.000.

Purdue Research Foundation: *See*—
Sallay, Stephen I., 4,493,898, Cl. 436-64.000.

Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,493,911, Cl. 523-109.000.

Putt, James B., to Bendix Corporation, The. Method for adjusting a vacuum brake booster output member relative to a master cylinder piston. 4,493,742, Cl. 156-91.000.

Pyrox Limited: *See*—
McInnes, Malcolm B., 4,493,310, Cl. 126-92.00C.

Quan, James G. H.: *See*—
Kearns, Robert W.; and Quan, James G. H., 4,494,107, Cl. 340-347.0DA.

Quest Medical, Inc.: *See*—
Smith, Gordon E., 4,493,709, Cl. 604-246.000.

Quick, Leonard M.: *See*—
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,493,761, Cl. 208-10.000.

Quinot, Martin: *See*—
Echtler, Theodor; Quinot, Martin; and Hunsinger, Werner, 4,493,122, Cl. 14-2.400.

R&H Technology, Inc.: *See*—
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Racal-Milgo, Inc.: *See*—
Dambrackas, William A.; Marshall, Michael B.; Greenstein, Larry S.; and Downie, Alex, 4,494,232, Cl. 370-80.000.

Raceway Components, Inc.: *See*—
Kohaut, John E., 4,493,173, Cl. 52-221.000.

Radd, Fred J.; Scott, James B.; and Pan, Robert B., to Conoco Inc. Well completion system and process. 4,493,372, Cl. 166-285.000.

Ramey, Carl, to Micro Plastics Inc. Pneumatically driven rivet insert tool. 4,493,205, Cl. 72-391.000.

Ramlohr, Franz; Pohl, Werner; and Kolzer, Walter, to Siemens Aktiengesellschaft. Circuit arrangement for determining the polarity and magnitude of the load current in a reversible d-c controller or chopper. 4,494,181, Cl. 363-63.000.

Random House, Inc.: *See*—
Kaufmann, F. William, III; and Zwiebel, Alan, 4,493,650, Cl. 434-178.000.

Ransom, Stephen A.; and Stickel, Tedd K., to Sperry Corporation. High performance MESFET transistor for VLSI implementation. 4,494,016, Cl. 307-450.000.

Rao, G. R. Mohan: *See*—
Reddy, Chitranjan N.; and Rao, G. R. Mohan, 4,494,223, Cl. 365-233.000.
White, Lionel S.; and Rao, G. R. Mohan, 4,494,222, Cl. 365-222.000.

Rauma-Repola Oy: *See*—
Jaakonmaki, Matti; and Raura, Pentti, 4,493,352, Cl. 144-162.00R.

Raura, Pentti: *See*—
Jaakonmaki, Matti; and Raura, Pentti, 4,493,352, Cl. 144-162.00R.

Rautakoura, Timo, to Varpaja Oy. Support tube for a tubular assembly and method for the manufacture thereof. 4,493,579, Cl. 403-237.000.

Ravasz, Laszlo : *See*—
Vajda, Gabor; Ravasz, Laszlo ; Karacsonyi, Bela; and Tabajdi, Gabor, 4,493,853, Cl. 426-582.000.

Ravizza, Raymond F., to Ampex Corporation. Method of operating a signal reproduction apparatus for effecting synchronous reproduction of recorded signals. 4,494,153, Cl. 358-324.000.

Ray, Francis M.: *See*—
Lange, Howard G.; and Ray, Francis M., 4,493,166, Cl. 51-100.00R.

Raymond, Eugene T.: *See*—
Kilner, Jerome R.; Raymond, Eugene T.; and Warren, Steven M., 4,493,509, Cl. 303-13.000.

Raytheon Company: *See*—
Simon, James F., 4,493,521, Cl. 339-92.00M.

RCA Corporation: *See*—
Bernard, Francis S.; Eliscu, Steven M.; and Batterman, Eric P., 4,494,214, Cl. 364-724.000.
Callen, Patrick J.; and Pierce, Philip R., 4,494,063, Cl. 320-56.000.
Kelleher, Kevin C.; Kiser, Ned J.; and Christopher, Todd J., 4,494,052, Cl. 318-254.000.
Keller, Robert F., 4,494,034, Cl. 313-341.000.
Lea, Jeffrey G.; and Carlson, David J., 4,494,081, Cl. 331-36.00C.
Lovick, Richard B.; and Firestone, William L., 4,494,143, Cl. 358-122.000.
Naimpally, Saiprasad V.; and Tallant, James C., II, 4,494,146, Cl. 358-184.000.
Piascinski, Joseph J.; Axelrod, Randolph H.; and Mount, James, 4,493,668, Cl. 445-40.000.
White, Allan E.; Coleman, David E.; and Miller, Steven R., 4,493,651, Cl. 434-188.000.

Reagan, William J.: *See*—
Brown, Stanley M.; Durante, Vincent A.; Reagan, William J.; and Speronello, Barry K., 4,493,902, Cl. 502-65.000.

Red Dot Corporation: *See*—
Watters, Wayde H., 4,493,957, Cl. 200-81.00R.

Reddy, Chitranjan N.; and Rao, G. R. Mohan, to Texas Instruments Incorporated. Sequentially clocked substrate bias generator for dynamic memory. 4,494,223, Cl. 365-233.000.

Redmond, Sanford; and Mainberger, Walter A., to Redmond, Sanford. Dispenser package having fault line protrusion. 4,493,574, Cl. 401-132.000.

Reed, Charles C. Blood gas concentration control apparatus and method. 4,493,692, Cl. 604-4.000.

Reed, David E.: *See*—
Platt, Kenneth B.; and Reed, David E., 4,493,825, Cl. 424-88.000.

Reed, I. Ely: *See*—
Garcia, Carlos M.; Reed, I. Ely; and McLeod, Dale K., 4,493,150, Cl. 30-97.000.

Reed, Kenneth E.; Mason, Bradley; Mason, Jeff; and Nelson, Gregory R., to DonJoy, Inc. Articulating knee stabilizer. 4,493,316, Cl. 128-80.00C.

Reed, Larry T., to Axia Incorporated. Method for reduction of oxides and improving porosity of metalized zirconium oxide ceramics. 4,493,746, Cl. 156-644.000.

Reedyk, Cornelis W.: *See*—
Retallack, Laurence J.; and Reedyk, Cornelis W., 4,493,949, Cl. 179-18.0BC.

Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., to Electric Power Research Institute, Inc. Cable reaming apparatus and method. 4,493,379, Cl. 175-57.000.

Reider, Donald F.: *See*—
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.

Reisberg, Joseph; Bielamowicz, Lawrence J.; and Thigpen, David R., to Shell Oil Company. Recovering oil by injecting aqueous alkali, cosurfactant and gas. 4,493,371, Cl. 166-274.000.

Relyea, Keith E.: *See*—
Sweeny, Norman P.; Relyea, Keith E.; and Brustad, Wayne L., 4,493,869, Cl. 428-201.000.

Rendu, Michel: *See*—
Loriot, Pierre; Rendu, Michel; and Rousseau, Jean, 4,493,813, Cl. 376-409.000.

Renfro, Wesley E. Hydraulic choking device. 4,493,336, Cl. 137-312.000.

Renken, Albert: *See*—
Flaschel, Erwin; and Renken, Albert, 4,493,735, Cl. 134-25.100.

Retallack, Laurence J.; and Reedyk, Cornelis W., to Northern Telecom Limited. Parallel operation of telephone equipment on a digital loop. 4,493,949, Cl. 179-18.0BC.

Reverchon, Bernard: *See*—
Ohayon, Gerard; Reverchon, Bernard; Tourre, Bernard; and Vigier, Serge, 4,493,271, Cl. 110-262.000.

Rexer, Felix. Valve arrangement. 4,493,473, Cl. 251-63.400.

Rexnord Inc.: *See*—
Cosenza, Frank J., 4,493,577, Cl. 403-41.000.

Reymond, Jean-Claude; Bertrand, Gilles; and Gabanou, Roland, to Thomson-CSF. Moving-map display with recording on photographic film. 4,494,201, Cl. 364-449.000.

Reynolds, George O., to Honeywell Inc. High sensitivity focal sensor for electron beam and high resolution optical lithographic printers. 4,493,555, Cl. 356-358.000.

Rhoades, James J., to Tapco Products Company, Inc. Portable sheet bending brake. 4,493,200, Cl. 72-319.000.

Rhodes, Richard P.; and Hershkowitz, Frank, to Exxon Research and Engineering Co. Pretreatment of oil-shale for enhanced arsenic removal. 4,493,763, Cl. 208-11.00R.

Rhodes, Robert B., to Shell Oil Company. Lubricating oil composition with supplemental rust inhibitor. 4,493,776, Cl. 252-25.000.

Rhone-Poulenc Agrochimie: *See*—
de Reinach Hirtzbach, Francois; and Ambrosi, Dominique, 4,493,729, Cl. 71-94.000.

Ricci, Ruggiero. Violin bow with adjustable weight. 4,493,238, Cl. 84-282.000.

Rice, Mathias F.: *See*—
Miles, Lee W.; Chambers, Samuel W.; and Rice, Mathias F., 4,493,586, Cl. 405-17.000.

Richmond, Raymond W. One-handed paddle. 4,493,663, Cl. 440-101.000.

Ricoh Company, Ltd.: *See*—
Araki, Shigeyuki, 4,493,570, Cl. 400-144.200.
Furukawa, Noboru, 4,494,149, Cl. 358-257.000.
Hashimoto, Masanori; and Ogawa, Shunichi, 4,493,573, Cl. 400-647.100.
Ishima, Kazumi, 4,494,178, Cl. 363-21.000.
Kaneko, Yutaka; and Takashi, Yokata, 4,494,130, Cl. 346-160.000.

Riddell, David: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Chapman, Robert F.; Fenton, Garry; Loveless, Anthony H.; and Riddell, David, 4,493,843, Cl. 424-274.000.

Rieppel, Perry J.; and Coughlin, William J., to Arcair Company. Slag and fume collector for air carbon-arc cutting and gouging torches. 4,493,970, Cl. 219-137.410.

Rifi, Mahmoud R., to Union Carbide Corporation. Water-curable, silane modified chlorosulfonated olefinic polymers and a process for the preparation thereof. 4,493,924, Cl. 525-102.000.

Rikagaku Kenkyusho: *See*—
Ohta, Hiroshi, 4,494,131, Cl. 357-5.000.

Rimrock Corporation: *See*—
Kirsch, Jerry; Kirsch, Kerry F.; and Hornacek, Kenneth J., 4,493,245, Cl. 92-2.000.

Rinderle, Heinz, to TELEFUNKEN electronic GmbH. Signal input circuit with controlled input signal attenuation. 4,494,076, Cl. 330-284.000.

Rinehart, Kenneth L., Jr., to Board of Trustees, Univ. of Ill. Didemnins A, B, C, and derivatives thereof, as antiviral agents. 4,493,796, Cl. 260-112.50R.

Rissanen, Jorma J.: *See*—
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,494,108, Cl. 340-347.0DD.

Rittenhouse, Raymond G. Tree stand for hunters. 4,493,395, Cl. 182-187.000.

Rivinius, Theodore. Cable winding apparatus. 4,493,463, Cl. 242-158.00F.

Roach, Peter F., to United Kingdom Atomic Energy Authority. Transducers for providing an electrical signal representative of physical movement. 4,493,214, Cl. 73-779.000.

Roach, Thomas C. Adjustable pipe fastener. 4,493,468, Cl. 248-62.000.

Robbins, Cheston W.; and Kelly, Robert M., to Technicare Corporation. Biopsiable ultrasound phantom. 4,493,653, Cl. 434-262.000.

Robert Bosch GmbH: *See*—
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, 4,494,101, Cl. 336-210.000.
Fries, Herbert; Gerstenmaier, Jurgen; Kircher, Stefan; and Koch-Ducker, Jurgen, 4,493,210, Cl. 73-121.000.
Gast, Theodor; Binder, Kurt; and Honig, Gunter, 4,493,215, Cl. 73-861.180.
Gunther, Klaus; Hornung, Friedrich; Paule, Kurt; and Schadlich, Fritz, 4,493,377, Cl. 173-170.000.

Robinson, Edward L., Jr.; and Stamp, Tom G., to International Harvester Company. Furrow forming apparatus for a seed planter. 4,493,274, Cl. 111-88.000.

Rocci, Joseph D.; Crook, Stephen E.; and Kauffman, Marc, to General Instrument Corporation. Frequency agile security apparatus. 4,494,111, Cl. 340-533.000.

Roche, William J.; and Anderson, John W., Jr., to GTE Products Corporation. Incandescent ballast assembly. 4,494,041, Cl. 315-49.000.

Roche, William J., to GTE Products Corporation. Mercury target sensing and locating apparatus. 4,494,042, Cl. 315-56.000.

Rockwell International Corporation: *See—*
Brown, James L., 4,494,019, Cl. 307-491.000.
Glass, Howard L., 4,493,819, Cl. 423-277.000.
Kleiman, William J., 4,493,449, Cl. 228-7.000.
Niemiro, Josef W.; and Skipor, Eugene, 4,493,690, Cl. 493-444.000.
Wallschlaeger, Alan R.; and Wade, John F., 4,493,258, Cl. 101-415.100.

Rockwell-Rimoldi S.p.A.: *See—*
Sanvito, Roberto, 4,493,277, Cl. 112-153.000.

Rogers Corporation: *See—*
Schilling, Donald P., 4,494,170, Cl. 361-306.000.
Watson, William A., 4,494,169, Cl. 361-306.000.

Rohm, Gunter H. Actuator for power chuck. 4,493,242, Cl. 91-1.000.

Rolf, Jeffrey O., to Eaton Corporation. Nut lock assembly. 4,493,597, Cl. 411-198.000.

Roller, Timothy J.: *See—*
Strickland, Reid A.; and Roller, Timothy J., 4,493,476, Cl. 251-176.000.

Rollins, George E.: *See—*
Gontowski, Walter S., Jr.; and Rollins, George E., 4,494,088, Cl. 331-111.000.

Rolls-Royce Limited: *See—*
Clark, Stephen D.; Wood, Philip S.; and Fell, Peter J., 4,493,451, Cl. 228-119.000.
Hobbs, John R., 4,493,185, Cl. 60-39.092.

Rolm Corporation: *See—*
Jolissaint, Charles H., 4,494,229, Cl. 370-58.000.

Romansky, John A., to Eastman Kodak Company. Holder apparatus for heater element. 4,493,982, Cl. 219-469.000.

Roodvoets, Mark R.: *See—*
Dieckmann, J. Robert; Lauber, Michael L.; and Roodvoets, Mark R., 4,493,631, Cl. 425-292.000.

Rosenbaum, Walter S.: *See—*
Brickman, Norman F.; and Rosenbaum, Walter S., 4,494,150, Cl. 358-260.000.

Roth, Ian S.: *See—*
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.

Roth, Martin; and Stahn, Bernhard, to Messerschmitt-Bolkow-Blohm GmbH. Clutch and brake with bearing protection. 4,493,405, Cl. 192-18.00R.

Rotron Incorporated: *See—*
Brown, Fred A., 4,494,028, Cl. 310-156.000.

Rouhotas, Louie M., Sr. Agricultural planter with sled frame, vacuum dispensing and ground drive. 4,493,272, Cl. 111-59.000.

Rousseau, Jean: *See—*
Loriot, Pierre; Rendu, Michel; and Rousseau, Jean, 4,493,813, Cl. 376-409.000.

Rubin, Michael: *See—*
Carroll, Thomas J.; Rubin, Michael; Piccolo, Dominic J.; and Glass, Michael, 4,493,849, Cl. 426-3.000.

Rudnick, Leslie R., to Mobil Oil Corporation. Method for reducing the nitrogen content of shale oil with spent oil shale and sulfuric acid. 4,493,762, Cl. 208-11.00R.

Ruechel, Frank, to Isover Saint-Gobain. Thermal insulation jacket having curved tube or pipe. 4,493,345, Cl. 138-178.000.

Ruehl, William E., to Illinois Tool Works, Inc. Retaining prong. 4,493,580, Cl. 403-252.000.

Ruf, Urs: *See—*
Petrzilka, Martin; Pracht, Inge; and Ruf, Urs, 4,493,533, Cl. 350-418.000.

Ruff, Stanley L. Corrugated carton cutter. 4,493,148, Cl. 30-2.000.

Runde, Herbert A.: *See—*
Comeau, Joseph H.; Kowles, Joseph E.; Lareau, John P.; Mayo, Kenneth R.; and Runde, Herbert A., 4,493,155, Cl. 33-366.000.

Ruprich, Wilhelm: *See—*
Bader, Leonhard; Hermann, Ferdinand; Ruprich, Wilhelm; and Winter, Hermann, 4,493,137, Cl. 29-25.350.

Rush, James P.: *See—*
Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuake, Stanley, 4,494,003, Cl. 250-474.100.

Rutgerswerke Aktiengesellschaft: *See—*
Orth, Winfried; and Fickert, Werner, 4,493,935, Cl. 548-562.000.

Ruti Machinery Works, Ltd.: *See—*
Lutz, Friedrich, 4,493,347, Cl. 139-449.000.

Rutili, Renzo N.: *See—*
Hamilton, Lawrence E.; and Rutili, Renzo N., 4,493,958, Cl. 200-314.000.

Rutter, Christopher C. Fluid dispenser. 4,493,438, Cl. 222-83.000.

Rutty, John G.: *See—*
Arndt, Alfred; and Rutty, John G., 4,494,244, Cl. 455-78.000.

Rye, Palle: *See—*
Ganter, Robert; Whitmoyer, Robert; and Rye, Palle, 4,493,637, Cl. 431-190.000.

Rygalin, Viktor G.: *See—*
Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., 4,493,213, Cl. 73-664.000.

S&C Electric Company: *See—*
Jarosz, John M.; and Panas, William R., 4,494,103, Cl. 337-282.000.

S. C. Johnson & Son, Inc.: *See—*
Chapman, Francis E.; and Harris, Robert B., 4,493,781, Cl. 252-88.000.

Sachdev, Harbans S.; and Sachdev, Krishna G., to International Business Machines Corporation. Use of plasma polymerized organosilicon films in fabrication of lift-off masks. 4,493,855, Cl. 427-41.000.

Sachdev, Krishna G.: *See—*
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,493,855, Cl. 427-41.000.

Sadeh, Yaacov, to Beta Engineering & Development Ltd. Pocket setter unit and automatic sewing machine including same. 4,493,276, Cl. 112-121.120.

Safe-Base, Inc.: *See—*
Fuller, Charles C.; and Hendrickson, James L., 4,493,486, Cl. 273-25.000.

Saint-Gobain Vitrage: *See—*
Schwarzenberg, Norbert; Ueberwolf, Heinz; Halberschmidt, Friedrich; and Audi, Joseph, 4,493,724, Cl. 65-273.000.

St. Pierre, Henry G. Tire chain. 4,493,354, Cl. 152-242.000.

Saito, Iwao. Apparatus for treating spasmodic torticollis. 4,493,328, Cl. 128-782.000.

Saito, Motoyuki: *See—*
Fukutome, Satoru; Hatanaka, Hideo; and Saito, Motoyuki, 4,493,560, Cl. 368-88.000.

Saito, Yasuo: *See—*
Nagashima, Akira; and Saito, Yasuo, 4,493,400, Cl. 188-77.00W.

Saka, Masakazu, to Sharp Kabushiki Kaisha. Combined thermometer and calculator. 4,493,565, Cl. 374-185.000.

Sakai, Takami: *See—*
Inokuchi, Haruhisa; and Sakai, Takami, 4,494,179, Cl. 363-35.000.

Sakai, Tomohiko: *See—*
Fujiwara, Koichi; Sakai, Tomohiko; Yamada, Yoneo; and Higashine, Kazutaka, 4,493,739, Cl. 148-111.000.

Sakuma, Yuichiro: *See—*
Taniguchi, Seiho; and Sakuma, Yuichiro, 4,493,787, Cl. 252-511.000.

Sallay, Stephen I., to Purdue Research Foundation. Method for detecting and monitoring cancer. 4,493,898, Cl. 436-64.000.

Sami, Shunsuke: *See—*
Ono, Keiichi; Sugie, Akihiko; Kawakami, Hajime; Sami, Shunsuke; Kojima, Atsuyuki; and Katsube, Junki, 4,493,846, Cl. 424-308.000.

Sanden, Roland, to Forsvarets Forskningsanstalt. Method for extension of pot life in curing reactions. 4,493,916, Cl. 524-217.000.

Sander, Nils B. L.; and Nadas, Julius, to Knorr-Bremse GmbH. Automatic brake resetting device. 4,493,401, Cl. 188-199.000.

Sanderson, Edward; Sanderson, Laurence S.; and Kalinowski, Robert S., Jr. Device for use in testing a modem coupled to a telephone line by modular connectors. 4,493,951, Cl. 179-175.30F.

Sanderson, Laurence S.: *See—*
Sanderson, Edward; Sanderson, Laurence S.; and Kalinowski, Robert S., Jr., 4,493,951, Cl. 179-175.30F.

Sandmann, Jurgen: *See—*
Deike, Karl-Heinz; Schulz, Hans-Joachim; and Sandmann, Jurgen, 4,493,510, Cl. 303-28.000.

Sands, Robert W.; Marella, Joseph P.; and Fink, Thomas F., Jr., to General Electric Company. Lamps having multiple and aimed parabolic sections for increased useful light output. 4,494,176, Cl. 362-297.000.

Sands, William K., Jr.: *See—*
Morrell, David J.; DeVault, Donald G.; and Sands, William K., Jr., 4,494,224, Cl. 367-2.000.

Sankin Kogyo Kabushiki Kaisha: *See—*
Ai, Minoru; Manabe, Akira; Igarashi, Yoshimasa; and Mizuno, Katsuya, 4,493,644, Cl. 433-75.000.

Sanofi: *See—*
Chekroun, Isaac; and Heymes, Alain, 4,493,931, Cl. 546-329.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Iwai, Tomio, 4,493,661, Cl. 440-77.000.
Iwashita, Takashi, 4,493,659, Cl. 440-61.000.
Taguchi, Michihiro, 4,493,662, Cl. 440-83.000.

Santrade Ltd.: *See—*
Okada, Minoru, 4,493,594, Cl. 407-41.000.

Sanvito, Roberto, to Rockwell-Rimoldi S.p.A. Workpiece positioner for sewing units. 4,493,277, Cl. 112-153.000.

Sanyo Electric Co., Ltd.: *See—*
Takaoka, Daizo, 4,493,940, Cl. 136-248.000.

Sarazen, Paul M., Jr.; and Beam, Dennis A. Temperature-responsive automatic ventilator. 4,493,456, Cl. 236-49.000.

Satchell, Terry L.; and Custance, Robert E., to General Motors Corporation. Alignment adjustment apparatus for vehicle wheel suspension. 4,493,493, Cl. 280-661.000.

Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, to Nippon Petrochemicals Company, Limited. Electrical insulating oil and oil-filled electrical appliances. 4,493,943, Cl. 174-25.00C.

Sato, Mikio: *See—*
Kaneko, Masaharu; Ozawa, Tetsuo; Yoneyama, Tomio; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,493,532, Cl. 350-349.000.
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.

Sato, Tadayuki: *See—*
Nishizawa, Hiroshi; Sato, Tadayuki; and Ishikawa, Takashi, 4,493,858, Cl. 427-104.000.

Saureaman, Donald G., to Consan Pacific Incorporated. Flexible cable ion dispenser for treatment zones. 4,493,289, Cl. 119-21.000.

Scammell, Roger S., to British Petroleum Company, p.l.c., The. Post-aerated burner for ground flare, and ground flare incorporating same. 4,493,638, Cl. 431-202.000.
Scandurra, Giancarlo: *See*—
Andrione, Norbert; Peruzzi, Federigo; and Scandurra, Giancarlo, 4,493,226, Cl. 74-598.000.
Schadlich, Fritz: *See*—
Gunther, Klaus; Hornung, Friedrich; Paule, Kurt; and Schadlich, Fritz, 4,493,377, Cl. 173-170.000.
Schenetin, Norbert: *See*—
Bredel, Walter; Schenetin, Norbert; and Waigand, Helmut, 4,493,979, Cl. 219-446.000.
Schenker, Monroe H.: *See*—
Kaeslin, Oscar E.; and Schenker, Monroe H., 4,493,423, Cl. 211-123.000.
Schering Aktiengesellschaft: *See*—
Pistor, Dieter; and Mankut, Ludwig, 4,493,429, Cl. 220-211.000.
Schering Corporation: *See*—
Strayer, James G., 4,493,826, Cl. 424-118.000.
Schierling, Bernhard: *See*—
Anders, Peter; and Schierling, Bernhard, 4,493,673, Cl. 464-66.000.
Schilling, Donald P., to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,494,170, Cl. 361-306.000.
Schillke, Peter: *See*—
Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., 4,493,701, Cl. 604-73.000.
Schindel, Arnold, to Singer Company, The. Fiber optic sensor for shaft state. 4,493,997, Cl. 250-231.0SE.
Schively, Dixon P.: *See*—
Christiansen, David W.; and Schively, Dixon P., 4,493,812, Cl. 376-352.000.
Schleihauf, Gerhard: *See*—
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,493,865, Cl. 428-52.000.
Schlemmer, Lothar: *See*—
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.
Schlimbach, Heinrich, to Ferroplast Gesellschaft fur Metall- und Kunststoffepzeucnisse mbH. Method and device for continuous transporting powdered, fine-grained and coarse-grained materials. 4,493,593, Cl. 406-146.000.
Schlosser, Gerhard: *See*—
Koszytorz, Gunther; Lucke, Herbert; Schlosser, Gerhard; and Vath, Joachim, 4,493,990, Cl. 250-201.000.
Schlumberger Electronic (U.K.) Ltd.: *See*—
Wakeling, Antony J.; and Thompson, Alan D., 4,494,110, Cl. 340-365.00R.
Schmid, Leopold F. Self-locking differential gear unit; more specially for motor vehicles. 4,493,227, Cl. 74-711.000.
Schmidt, Donald J., to Alco Industries, Inc. Method of making a metal bottle for exotic gases under pressure. 4,493,201, Cl. 72-349.000.
Schmidt, Erich, to MZW Maschinenfabrik Zuckermann Pachtgesellschaft mbH. Apparatus for copy-machining a workpiece. 4,493,351, Cl. 144-3.00R.
Schmidt, Hans-Jorg: *See*—
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, 4,494,101, Cl. 336-210.000.
Schmidt, K. Ulf: *See*—
Oliva, Rudolf; and Schmidt, K. Ulf, 4,493,241, Cl. 89-1.140.
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, to Espe Fabrik pharmazeutischer Praparate, GmbH. Nonadhesive impression material. 4,493,911, Cl. 523-109.000.
Schnaus, Martin: *See*—
Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, 4,493,234, Cl. 83-175.000.
Schneider, David A.: *See*—
Payne, Thomas R.; and Schneider, David A., 4,493,980, Cl. 219-450.000.
Schneider, Richard L.: *See*—
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., 4,494,043, Cl. 315-111.410.
Schonowsky, Hubert: *See*—
Horlein, Gerhard; Schonowsky, Hubert; Bieringer, Hermann; and Langeluddeke, Peter, 4,493,731, Cl. 71-118.000.
Schopper, Bernd; and Tandler, Peter, to ITT Industries, Inc. Dual-circuit pressure control valve. 4,493,508, Cl. 303-6.00C.
Schroeder, Walter W., to Sprague Electric Company. Wet-electrolyte capacitor package. 4,494,174, Cl. 361-433.000.
Schubert, Hiltmar: *See*—
Muller, Dietmar; Schubert, Hiltmar; and Krohnert, Rudolf, 4,493,630, Cl. 425-203.000.
Schuck, David B.: *See*—
Gunderson, Robert O.; Kocol, James C.; and Schuck, David B., 4,494,185, Cl. 364-200.000.
Schultz, Ward E.: *See*—
Smith, Harry D., Jr.; Arnold, Dan M.; and Schultz, Ward E., 4,493,998, Cl. 250-252.100.
Schulz, Hans-Joachim: *See*—
Deike, Karl-Heinz; Schulz, Hans-Joachim; and Sandmann, Jurgen, 4,493,510, Cl. 303-28.000.
Schutz, Rudolph W.; and Weis, Rudolf R., to Crown Zellerbach Corporation. Shrink tunnel with movable gate. 4,493,159, Cl. 34-43.000.
Schwalm, Walter A. Convergence device for color-producing cathode ray tube. 4,494,047, Cl. 315-368.000.
Schwartz, Ellen S.; and Tincher, Cline A., to BASF Wyandotte Corporation. Water-based hydraulic fluids having improved lubricity and corrosion inhibiting properties. 4,493,780, Cl. 252-73.000.
Schwartz, Jay W., to United States of America, Navy. Balanced system for ranging and synchronization between satellite pairs. 4,494,211, Cl. 364-571.000.
Schwarzenberg, Norbert; Ueberwolf, Heinz; Halberschmidt, Friedrich; and Audi, Joseph, to Saint-Gobain Vitrage. Apparatus for bending glass sheets. 4,493,724, Cl. 65-273.000.
Schweizer, Randy, to Chemco Manufacturing Co., Inc. Paint spray filter system. 4,493,718, Cl. 55-491.000.
Schweizerische Aluminium AG (Swiss Aluminium Ltd.): *See*—
Mittelmann, Gerhard J.; and Liebherr, Ricardo W., 4,493,428, Cl. 220-1.500.
Schwenzer, Alfred F.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,493,744, Cl. 156-568.000.
SCI Systems, Inc.: *See*—
King, Olin B., 4,494,127, Cl. 346-82.000.
Scortecci, Giuseppe: *See*—
Bucefari, Massimo; and Scortecci, Giuseppe, 4,493,183, Cl. 59-16.000.
Scott, James B.: *See*—
Radd, Fred J.; Scott, James B.; and Pan, Robert B., 4,493,372, Cl. 166-285.000.
Scovell, Edward G.: *See*—
Birkett, Kevin; Scovell, Edward G.; and John, Glyn R., 4,493,876, Cl. 428-457.000.
Scovill, John P.: *See*—
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,493,930, Cl. 544-360.000.
Sealright Co., Inc.: *See*—
Smith, Ernest L., 4,493,432, Cl. 220-270.000.
Searight, Edward F.: *See*—
Hurley, James R.; Searight, Edward F.; and Nunes, Maurice, 4,493,308, Cl. 126-41.00R.
Sebesta, Gunter: *See*—
Stillfried, Rudiger F. V.; Seegers, Gunter; and Sebesta, Gunter, 4,493,244, Cl. 91-420.000.
Sedam, Jason K.; Mueller, Richard J.; and Holoubek, Andrew J., to Coca-Cola Company, The. Portable post-mix beverage dispenser unit. 4,493,441, Cl. 222-129.100.
Sedlatschek, Robert; and McGann, Leo E., to Singer Company, The. Method of molding a sewing machine frame of fiber reinforced composition. 4,493,808, Cl. 264-108.000.
Seegers, Gunter: *See*—
Stillfried, Rudiger F. V.; Seegers, Gunter; and Sebesta, Gunter, 4,493,244, Cl. 91-420.000.
Seiko Instruments & Electronics Ltd.: *See*—
Ishida, Takashi; and Shida, Masaharu, 4,493,559, Cl. 368-74.000.
Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, to Tokyo Shibaura Denki Kabushiki Kaisha. Preamplifier for a wide range neutron flux monitoring system. 4,493,811, Cl. 376-254.000.
Seki, Fumio, to Yoshida Kogyo K.K. Apparatus for orienting and placing a button for attachment to a garment. 4,493,448, Cl. 227-119.000.
Seki, Shinichiro: *See*—
Shimamoto, Kunihiro; Hatanaka, Hiroshi; Seki, Shinichiro; and Orita, Ryozo, 4,493,938, Cl. 568-62.000.
Sekido, Tetsuya: *See*—
Kokufukata, Seigo; and Sekido, Tetsuya, 4,494,145, Cl. 358-163.000.
Selman, Gordon L.: *See*—
Collier, Owen N.; and Selman, Gordon L., 4,493,738, Cl. 148-24.000.
Semanchik, Stephen; and Mezei, George. Walking aid. 4,493,334, Cl. 135-75.000.
Senco Products, Inc.: *See*—
Becht, Carl T., 4,493,322, Cl. 128-334.00R.
Sera, Katsumi: *See*—
Nishijima, Hideo; Sera, Katsumi; Fukushima, Isao; and Kobori, Yasunori, 4,494,056, Cl. 318-269.000.
Serber, Hector. Mechanic's rest. 4,493,393, Cl. 182-129.000.
Sevastakis, Gus. Continuous casting apparatus. 4,493,361, Cl. 164-443.000.
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Chen, Lee; Khoury, Henri A.; and Seymour, Harlan R., 4,493,745, Cl. 156-626.000.
Sguazzin, Aldo. Continuously deodorized toilet. 4,493,117, Cl. 4-213.000.
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Sharp Kabushiki Kaisha: *See*—
Saka, Masakazu, 4,493,565, Cl. 374-185.000.
Sharp, Larry L.; and Klosinski, Mark, to Illinois Tool Works, Inc. Force transducer. 4,493,219, Cl. 73-862.050.
Shaw, Herbert J.; and Bergh, Ralph A., to Leland Stanford Junior University, Board of Trustees of the. Fiber optic directional coupler. 4,493,528, Cl. 350-96.150.

Shaw, Lockburn S.: *See*—
Groutage, Frederick D.; Conjerti, Samuel N.; and Shaw, Lockburn S., 4,493,136, Cl. 24-573.000.

Shell Oil Company: *See*—
Ayers, Ray R.; and Hemphill, Dean P., 4,493,590, Cl. 405-170.000.
Durbin, Daniel P.; Lutz, Robert G.; and Danforth, Richard L., 4,493,919, Cl. 524-505.000.
Koilmeyer, Willy D., 4,493,936, Cl. 549-474.000.
McCullough, J. Douglas, Jr., 4,493,923, Cl. 525-88.000.
Pilgram, Kurt H., 4,493,728, Cl. 71-92.000.
Reisberg, Joseph; Bielamowicz, Lawrence J.; and Thigpen, David R., 4,493,371, Cl. 166-274.000.
Rhodes, Robert B., 4,493,776, Cl. 252-25.000.
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Sheng, Ping; and Stepleman, Robert S., to Exxon Research and Engineering Co. Solar cell with two-dimensional reflecting diffraction grating. 4,493,942, Cl. 136-259.000.

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Piscitelli, R. Amelia; Hemmer, Valentine J.; and Shepler, Eric F., 4,493,527, Cl. 339-258.00R.

Shibahara, Yoshihumi: *See*—
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Shibata, Atsushi; and Ueno, Yukichi, to Hitachi, Ltd. Beam scanning control device for ion implantation system. 4,494,005, Cl. 250-492.200.

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Husted, Royce H., 4,493,678, Cl. 474-164.000.

Shida, Masaharu: *See*—
Ishida, Takashi; and Shida, Masaharu, 4,493,559, Cl. 368-74.000.

Shigemasa, Saito, to Fuji Electric Co., Ltd. Method of joining electrically conductive members. 4,493,964, Cl. 219-78.020.

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Shiiba, Minoru: *See*—
Ohmura, Hiroshi; Kohno, Atsuo; Shiiba, Minoru; and Tanaka, Tsutomu, 4,493,542, Cl. 354-82.000.

Shima, Yoshihiro; Kashioka, Seiji; Uno, Takeshi; and Suzuki, Kunio, to Hitachi, Ltd. Automatic assembly system. 4,494,139, Cl. 358-101.000.

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Yano, Shozo; Komoto, Akira; and Fujinaga, Yasuhiro, 4,493,384, Cl. 177-25.000.

Shimamoto, Kunihiro; Hatanaka, Hiroshi; Seki, Shinichiro; and Orita, Ryozo, to Toyo Kasei Kogyo Co., Ltd. Method for the production of thioalkylene glycols. 4,493,938, Cl. 568-62.000.

Shimazaki, Norihiko: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,493,832, Cl. 424-199.000.

Shimizu, Hiroshi: *See*—
Arai, Tetsuji; Mimura, Yoshiki; and Shimizu, Hiroshi, 4,493,977, Cl. 219-411.000.

Shimizu, Takao: *See*—
Nawa, Akiyoshi; and Shimizu, Takao, 4,493,971, Cl. 219-137.520.

Shimp, Richard L., to ComSonics, Inc. Segmented upstream management for cable television. 4,494,138, Cl. 358-86.000.

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Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, 4,493,811, Cl. 376-254.000.

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Sideri, Leonardo; and Del Brocco, Enzo, to Sideri, Leonardo. Self-locking pilfer proof tamper evident container. 4,493,433, Cl. 220-306.000.

Sidler, Karl. Safe keeping box assembly. 4,493,268, Cl. 109-52.000.

Sie, Swan K., to Chicago Bridge & Iron Company. Floating roof seal using a coil spring. 4,493,430, Cl. 220-224.000.

Siegmann, Robert L. Produce spin dryer. 4,493,156, Cl. 34-8.000.

Siemens Aktiengesellschaft: *See*—
Frieling, Focko; Michael, Ewald; and Nikutta, Wolfgang, 4,494,015, Cl. 307-268.000.
Hassler, Dieter, 4,493,216, Cl. 73-861.250.
Koszytorz, Gunther; Lucke, Herbert; Schlosser, Gerhard; and Vath, Joachim, 4,493,990, Cl. 250-201.000.
Leitgeb, Wilhelm, 4,494,049, Cl. 318-138.000.
Martin, Erwin, 4,494,032, Cl. 310-324.000.
Ramlohr, Franz; Pohl, Werner; and Kolzer, Walter, 4,494,181, Cl. 363-63.000.
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Vrouenraets, Cornelius M. F.; and Sikkema, Doetze J., 4,493,870, Cl. 428-245.000.

Silverio, Shaun: *See*—
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Silvestrini, Jesus A., to IMDEC S.R.L. Method for separating the pulp from the skin of tomatoes. 4,493,851, Cl. 426-482.000.

Simnad, Massoud T., to GA Technologies Inc. Uranium thorium hydride nuclear fuel. 4,493,809, Cl. 376-171.000.

Simon, James F., to Raytheon Company. Connector holder assembly. 4,493,521, Cl. 339-92.00M.

Simon, James R.; and Welburn, David J., to CXA Ltd./CXA LTEE. Reinforced explosive shock tube. 4,493,261, Cl. 102-331.000.

Simpson, Richard D., to Texas Instruments Incorporated. Microcomputer with high speed program memory. 4,494,187, Cl. 364-200.000.

Singer Company, The: *See*—
Cowdrey, Dennis A., 4,493,647, Cl. 434-2.000.
Odermann, Charles R., 4,493,279, Cl. 112-220.000.
Schindel, Arnold, 4,493,997, Cl. 250-231.0SE.
Sedlatschek, Robert; and McGann, Leo E., 4,493,808, Cl. 264-108.000.

Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for activating substrate surfaces for currentless metallization. 4,493,861, Cl. 427-304.000.

Site Microsurgical Systems, Inc.: *See*—
Cook, Kenneth P., 4,493,695, Cl. 604-27.000.

Siwon, Hans: *See*—
Steinel, Heinrich W.; and Siwon, Hans, 4,493,972, Cl. 219-230.000.

Skipor, Eugene: *See*—
Niemiro, Josef W.; and Skipor, Eugene, 4,493,690, Cl. 493-444.000.

SL Industries, Inc.: *See*—
Banks, Charles A., 4,493,515, Cl. 339-14.00L.

Slater, Harry F. Differential flow hydraulic transmission. 4,493,189, Cl. 60-489.000.

Slawy, Serge; Louvet, Olivier F.; and Dauphin, Jean L. Time division switching system for circuit mode and packet mode channels. 4,494,231, Cl. 370-60.000.

Smith, Benjamin V.: *See*—
Smith, Bobby E.; and Smith, Benjamin V., 4,493,497, Cl. 285-13.000.

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Smith, Ernest L., to Sealright Co., Inc. Tamper evident closure. 4,493,432, Cl. 220-270.000.

Smith, Gary R., to Kusel Equipment Company. Portable cheese press frame assembly. 4,493,250, Cl. 99-456.000.

Smith, Gordon E., to Quest Medical, Inc. Metering device for intravenous fluids. 4,493,709, Cl. 604-246.000.

Smith, Gordon R.; Stewart, John H.; and Bagnall-Wild, Ralph H., to Barr & Stroud Limited. Gun fire control systems. 4,494,198, Cl. 364-423.000.

Smith, Guy L. B.; Howard, Derik; and Goedhals, Anton B., to Grathnail Development Company Limited. Pressure monitor. 4,494,106, Cl. 340-58.000.

Smith, Harry D., Jr.; Arnold, Dan M.; and Schultz, Ward E., to Halliburton Company. Method for monitoring drilling materials for gamma ray activity. 4,493,998, Cl. 250-252.100.

Smith, Irving. Foldable display stand. 4,493,424, Cl. 211-149.000.

Smith, Joseph E., Jr., to O & S Manufacturing Company. Spherical and cylindrical bearings and method of manufacturing. 4,493,512, Cl. 308-2.00R.

Smith Kline & French Laboratories Limited: *See*—
Tovey, Geoffrey D., 4,493,822, Cl. 424-15.000.

Smith, Lloyd H.; and Teplitz, Raymond L., to City of Hope. Method of testing for particular antibodies in the serum of a patient. 4,493,899, Cl. 436-508.000.

Snap-on Tools Corporation: *See*—
Grover, Donald D., 4,493,208, Cl. 73-117.300.

Snell, Richard G.; and Loughridge, Fredrick A., to GTE Products Corporation. Solder glass and electrical device employing same. 4,493,944, Cl. 174-50.640.

Snyder, Kenneth L., Jr.; and Peters, James, to Dow Chemical Company, The. Water-based hydraulic fluids. 4,493,777, Cl. 252-49.300.

Societe Francaise Hoechst: *See*—
Gallois, Philippe; and Christidis, Yani, 4,493,937, Cl. 562-444.000.

Sofiyanski, Vassil M.: *See*—
Vassilev, Vassil B.; and Sofiyanski, Vassil M., 4,494,078, Cl. 330-297.000.

Soloway, Richard; and Capalvo, Enzo. Trap for flying insects. 4,493,161, Cl. 43-107.000.

Solvang, Egil S. Device on a valve for shutting off and/or controlling a flow of liquid. 4,493,337, Cl. 137-449.000.

Someya, Riyouichi: *See*—
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Sommer, Gordon M., to Petroleum Recovery Systems, Inc. Oil well pump drive. 4,493,613, Cl. 417-15.000.

Sonneborn, Lambertus J., to Applied Power Inc. Single cylinder tilt-cab anti-torsion apparatus. 4,493,386, Cl. 180-89.150.

Soquem-Societe Quebecoise d'Exploration Miniere: *See*—
Biss, Rudy, 4,493,817, Cl. 423-62.000.

Sorgi, Aladino D., to Cubic Corporation. Frequency generator using composite digitally controlled oscillators. 4,494,073, Cl. 328-14.000.

Soukup, Robert J.: *See*—
Zanno, Paul R.; Parliment, Thomas H.; Soukup, Robert J.; and McNaught, Richard P., 4,493,852, Cl. 426-535.000.

Southwest Research Institute: *See*—
Benson, Harvey S., 4,494,065, Cl. 324-61.00R.

Spano, John D.: *See—*
Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., 4,493,744, Cl. 156-568.000.
Spector, George: *See—*
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Spectra-Symbol Corporation: *See—*
House, V. Dean, 4,494,105, Cl. 338-114.000.
Speelman, Paul L., to Eaton Corporation. Remote manual shifting mechanism. 4,493,224, Cl. 74-473.00R.
Speich, Francisco, to Textilma AG. Coupling arrangement usable in a textile mac ine. 4,493,346, Cl. 139-76.000.
Speronello, Barry K.: *See—*
Brown, Stanley M.; Durante, Vincent A.; Reagan, William J.; and Speronello, Barry K., 4,493,902, Cl. 502-65.000.
Sperry Corporation: *See—*
Harkness, John C., 4,494,064, Cl. 323-277.000.
Kanamuller, Franz X.; and Phillips, Edwin R., 4,493,993, Cl. 250-222.100.
Lew, Eugene K.; and Wallace, Harvey W., 4,494,192, Cl. 364-200.000.
Miller, Harry, 4,494,210, Cl. 364-567.000.
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Vansteelant, Marc G., 4,493,498, Cl. 289-2.000.
Spinner, Georg; and Pitschi, Franz X., to Spinner GmbH Elektrotechnishe Fabrik. High frequency waveguide. 4,494,094, Cl. 333-239.000.
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Spinner, Georg; and Pitschi, Franz X., 4,494,094, Cl. 333-239.000.
Sporkenbach, Gustav-Adolf; and Suetterlin, Dieter, to Keller Holding AG; and Sporkenbach, Gustav-Adolf, a part interest. Method and oven for manufacturing a light construction element, particularly a cover plate. 4,493,805, Cl. 264-25.000.
Sportoletti, Giancarlo; Pagella, Piergiuseppe; and Cremonesi, Pietro, to Italfarmaco S.p.A. Bio-available succinylated protein-iron derivatives which do not cause gastric lesions, method of preparation and related pharmaceutical compounds. 4,493,829, Cl. 424-177.000.
Sprague Electric Company: *See—*
Gontowski, Walter S., Jr.; and Rollins, George E., 4,494,088, Cl. 331-111.000.
Schroeder, Walter W., 4,494,174, Cl. 361-433.000.
Sprecker, Mark A.; Belko, Robert P.; and Greene, Roger E., to International Flavors & Fragrances Inc. Organoleptic use of isopropyl tetramethylindanes. 4,493,790, Cl. 252-522.00R.
Spremulli, Paul F.: *See—*
Nayak, Ashok L.; and Spremulli, Paul F., 4,493,557, Cl. 366-300.000.
Springer, Gilbert D., to Ferix Corporation. Differetial-permeability field-concentrating magnetic read/write head. 4,494,125, Cl. 346-74.500.
Springthorpe, Anthony J., to Northern Telecom Limited. Diffusion equipment. 4,493,287, Cl. 118-719.000.
Srikrishnan, Kris V : *See—*
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Stafford Rail Products, Inc.: *See—*
Stafford, Richard J., 4,493,202, Cl. 72-353.000.
Stafford, Richard J., to Stafford Rail Products, Inc. Railroad spike forging machine. 4,493,202, Cl. 72-353.000.
Stahl, Daniel E.: *See—*
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Stahlhut, Leo G., to Emerson Electric Co. Monolithic ceiling modules and ceiling system. 4,493,171, Cl. 52-28.000.
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Roth, Martin; and Stahn, Bernhard, 4,493,405, Cl. 192-18.00R.
Stallings, Charles H.; Schneider, Richard L.; Childers, Frederick K.; Matthews, Stephen M.; Roth, Ian S.; Helava, Heikki I.; and Stringfield, Ray M., Jr., to Physics International Company. Imploding plasma device. 4,494,043, Cl. 315-111.410.
Stamp, Tom G.: *See—*
Robinson, Edward L., Jr.; and Stamp, Tom G., 4,493,274, Cl. 111-88.000.
Stanadyne, Inc.: *See—*
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Standard Oil Company (Indiana): *See—*
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,493,761, Cl. 208-10.000.
Standum Controls, Inc.: *See—*
Donnelly, Albert J., 4,494,010, Cl. 307-33.000.
Stangroom, James E., to National Research Development Corp. Electro-rheological transducer. 4,493,615, Cl. 417-48.000.
Stanley, Edwin L.: *See—*
Krause, Horst E.; and Stanley, Edwin L., 4,493,697, Cl. 604-50.000.
Stapp, Paul R.; and Chaney, Mary B., to Phillips Petroleum Company. Urea as a cosurfactant in enhanced oil recovery processes. 4,493,370, Cl. 166-273.000.
Starnes, Roger A. Serving dish with heating means. 4,493,978, Cl. 219-438.000.
Staroselsky, Naum; and Mirsky, Saul, to Compressor Controls Corporation. Method and apparatus for controlling a multicompressor station. 4,494,006, Cl. 290-4.000.
Stauffer Chemical Company: *See—*
Morgan, George J., 4,493,609, Cl. 415-20.000.
Stebbins, Leslie F.: *See—*
Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., 4,493,783, Cl. 252-174.230.
Steeg, Klaus, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,493,409, Cl. 192-115.000.
Steinel, Heinrich W.; and Siwon, Hans. Electrically heated apparatus employing a PTC heater for liquifying a rod of binding material. 4,493,972, Cl. 219-230.000.
Steinman, Kenneth. Tamper proof reel package for a fishing rod. 4,493,416, Cl. 206-315.110.
Stellram S.A.: *See—*
Grunsky, Manfred; Sussmuth, Reiner; Dehn, Dieter; and Ischen, Gunter, 4,493,596, Cl. 408-233.000.
Stengel, Robert E.; and Nejdl, Charles W., to Motorola, Inc. Planar inductors. 4,494,100, Cl. 336-200.000.
Stenglein, Paul R., to Carrier Corporation. Door latch. 4,493,499, Cl. 292-158.000.
Step Enterprises: *See—*
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Stepleman, Robert S.: *See—*
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Sterling, Henley F., to ITT Industries, Inc. Semiconductor switch device. 4,493,996, Cl. 250-227.000.
Sterner, Russell L., to Kidde, Inc. Attachment jib for cranes. 4,493,426, Cl. 212-261.000.
Stewart, David E.; and Nicholson, George R., to Hobson Limited. Forming of extrusion dies. 4,493,229, Cl. 76-107.00A.
Stewart, John H.: *See—*
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Stewart-Warner Corporation: *See—*
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Stickel, Tedd K.: *See—*
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Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Juergens, Tristan, to Gates Rubber Company, The. Variable speed, belt driven transmission system, speed sensing driver pulley and method. 4,493,221, Cl. 474-14.000.
Stillfried, Rudiger F. V.; Seegers, Gunter; and Sebesta, Gunter, to WABCO Fahrzeugbremsen GmbH. Pneumatic door operator. 4,493,244, Cl. 91-420.000.
Stockburger, Dieter: *See—*
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Stoll, Paul W.: *See—*
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Stover, Kenneth W., to Bunn-O-Matic Corporation. Apparatus for dissolving soluble coffee. 4,493,249, Cl. 99-275.000.
Strayer, James G., to Schering Corporation. Gentamicin-gleptoferron compositions. 4,493,826, Cl. 424-118.000.
Streater, August L.; and Dwyer, Daniel T., to Franklin Electric Co., Inc. Electrical power matching system. 4,494,180, Cl. 363-37.000.
Streib, Stephen F., to Chevron Research Company. Ultrasensitive apparatus and monitoring method for detecting change in fluid flow. 4,494,112, Cl. 340-606.000.
Stresau Laboratory, Inc.: *See—*
Norton, Jeffery R., 4,493,240, Cl. 89-1.140.
Strickland, Reid A.; and Roller, Timothy J. Slide valve for controlling fluid flow. 4,493,476, Cl. 251-176.000.
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Stroup, Larry J. Dead bolt and night chain combination. 4,493,500, Cl. 292-262.000.
Stuart, Marion W. Educational device. 4,493,654, Cl. 434-347.000.
Stuttgen, Friedel: *See—*
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Su, Kai C.; Stebbins, Leslie F.; and Bhatia, Rajkumar P., to Alcon Laboratories, Inc. Cleaning agent for optical surfaces. 4,493,783, Cl. 252-174.230.
Suarez, Jose I.: *See—*
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Hardee, Kim C.; and Sud, Rahul, 4,494,221, Cl. 365-203.000.
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Sues, John M.; and Cupani, Carmine, to Inteleplex Corporation, The. Transparent secondary information transmission system for an information transmission system. 4,493,948, Cl. 179-2.00A.
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Sugie, Akihiko: *See—*
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Sugimoto, Hachiro; Hamano, Sachiyuki; Shoji, Tadao; Kaneko, Takeru; and Uzuo, Takeshi, to Eisai Co., Ltd. Theobromine derivatives. 4,493,837, Cl. 424-253.000.

Sugimura, Masao: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, 4,494,116, Cl. 340-995.000.

Sugisawa, Yasuhiko, to Terumo Corporation. Intravascular catheter assembly. 4,493,708, Cl. 604-165.000.

Sugiura, Hajime: *See*—
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Suh, Sung S.: *See*—
Moon, Sang H.; Park, Jae M.; and Suh, Sung S., 4,493,725, Cl. 71-62.000.

Suhh, Jay Y. Oil mop. 4,493,576, Cl. 401-283.000.

Sullivan, John M.: *See*—
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Sulzer Brothers Limited: *See*—
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Zabelka, Jaroslav, 4,493,291, Cl. 122-7.00R.

Sulzer-Escher Wyss Ltd.: *See*—
Kubr, Vaclav; Mulhaupt, Bruno; and Paschedag, Hansjoachim, 4,493,768, Cl. 210-360.200.
Paschedag, Hansjoachim; Mulhaupt, Bruno; and Kubr, Vaclav, 4,493,769, Cl. 210-360.200.

Sumitomo Chemical Company, Limited: *See*—
Furuzawa, Kunihiko; Funaki, Yuji; Hisada, Yoshio; and Izumi, Kazuo, 4,493,842, Cl. 424-273.00R.
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Sundstrand Corporation: *See*—
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Sussmuth, Reiner: *See*—
Grunsky, Manfred; Sussmuth, Reiner; Dehn, Dieter; and Ischen, Gunter, 4,493,596, Cl. 408-233.000.

Suster, Mary E., to General Electric Company. Conductive ink for flashlamp array circuit. 4,493,639, Cl. 431-359.000.

Sutter, Leroy V., Jr., to Hughes Aircraft Company. Pulsed rf pumped waveguide laser. 4,494,236, Cl. 372-25.000.

Suyama, Tadakazu: *See*—
Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, 4,493,847, Cl. 424-317.000.

Suzuki, Hajime. Terrestrial globe. 4,493,648, Cl. 434-136.000.

Suzuki, Hajime; Matsuyama, Shinichiro; and Arakawa, Akio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for correcting the deviation of a predetermined stop position in a loom. 4,494,203, Cl. 364-470.000.

Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Semiconductor memories with α shield. 4,494,217, Cl. 365-53.000.

Suzuki, Kunio: *See*—
Shima, Yoshihiro; Kashioka, Seiji; Uno, Takeshi; and Suzuki, Kunio, 4,494,139, Cl. 358-101.000.

Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Kodama, Naoki, to Hitachi, Ltd. Magnetic bubble memory device. 4,494,216, Cl. 365-36.000.

Svatek, Thomas A., to Polaroid Corporation. Compact video slide projector. 4,494,148, Cl. 358-226.000.

Svensson, Bengt T.: *See*—
Josefsson, Lars G.; Svensson, Bengt T.; and Moeschlin, Lars F., 4,494,083, Cl. 333-33.000.

Sweeny, Norman P.; Relyea, Keith E.; and Brustad, Wayne L., to Minnesota Mining and Manufacturing Company. Fragrance-releasing microcapsules on a see-through substrate. 4,493,869, Cl. 428-201.000.

Swick, Robert H., to W. L. Gore & Associates, Inc. Apparatus for the separation of hydrogen sulfide from a gas mixture. 4,493,716, Cl. 55-158.000.

Syntex (U.S.A.) Inc.: *See*—
Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., 4,493,795, Cl. 260-112.50E.

Synthes Ltd. (U.S.A.): *See*—
Klaue, Kaj, 4,493,317, Cl. 128-92.00D.

Tabajdi, Gabor: *See*—
Vajda, Gabor; Ravasz, Laszlo ; Karacsonyi, Bela; and Tabajdi, Gabor, 4,493,853, Cl. 426-582.000.

Tabara, Takashi, to Olympus Optical Company Limited. Method for measuring an electrolyte in an automatic biochemical analyzing apparatus wherein a flame photometer is assembled. 4,493,897, Cl. 436-47.000.

Tachibana, Akifumi, to Kabushiki Kaisha Morita Seisakusho. Dental handpiece having non-contact rotational speed detection device. 4,493,643, Cl. 433-27.000.

Tada, Ikuo, to Alps Electric Co., Ltd. Impact dot printing head. 4,493,567, Cl. 400-124.000.

Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for visually indicating a current travel route of a vehicle. 4,494,116, Cl. 340-995.000.

Taggents, Inc.: *See*—
Dempsey, John C., 4,493,207, Cl. 73-40.700.

Taggert, Russell H. Current detector in combination with an electrical apparatus. 4,493,983, Cl. 219-494.000.

Taguchi, Michihiro, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Shaft connecting device for boat propellers. 4,493,662, Cl. 440-83.000.

Tai, Ichiro: *See*—
Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, 4,493,811, Cl. 376-254.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, 4,493,847, Cl. 424-317.000.

Tajima, Koichi: *See*—
Yamamoto, Masao; Yebisuya, Takashi; Kawai, Mituo; and Tajima, Koichi, 4,493,733, Cl. 75-126.00B.

Takada, Daizo: *See*—
Ito, Hirosato; and Takada, Daizo, 4,493,635, Cl. 431-90.000.

Takagi, Michiyuki: *See*—
Iino, Toshiki; Kaneko, Hiromi; Takagi, Michiyuki; and Komatsu, Kazuhiro, 4,493,610, Cl. 415-104.000.

Takahashi, Fumitaka: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, 4,494,116, Cl. 340-995.000.

Takahashi, Hiroyuki; and Ogata, Tomohiro, to Kanto Special Steel Works Ltd. Apparatus for rotary casting ingots. 4,493,360, Cl. 164-286.000.

Takahashi, Tohru: *See*—
Kaneko, Shuzo; Tamura, Yasuyuki; and Takahashi, Tohru, 4,493,882, Cl. 430-97.000.

Takahashi, Tsuneo: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, 4,494,116, Cl. 340-995.000.

Takahashi, Yoko: *See*—
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, 4,493,845, Cl. 424-279.000.

Takaji Kogya Kabushiki Kaisha: *See*—
Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, 4,494,159, Cl. 360-78.000.

Takano, Hiroshi, to Mitsuboshi Belting Ltd. Reinforced cog belt. 4,493,681, Cl. 474-265.000.

Takano, Toshio; and Mura, Shinichiro, to Fuji Jukogyo Kabushiki Kaisha. Parking lock mechanism for a shift lever. 4,493,403, Cl. 192-4.00A.

Takaoka, Daizo, to Sanyo Electric Co., Ltd. Sunlight-into-energy conversion apparatus. 4,493,940, Cl. 136-248.000.

Takara Co., Ltd.: *See*—
Terui, Masumi, 4,493,672, Cl. 446-464.000.

Takashi, Yokata: *See*—
Kaneko, Yutaka; and Takashi, Yokata, 4,494,130, Cl. 346-160.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,493,833, Cl. 424-246.000.

Takaya, Takao; Yasuda, Nobuyoshi; Tsutsumi, Hideo; and Matsuda, Keiji, to Fujisawa Pharmaceutical Co., Ltd. Aminoglycoside derivatives. 4,493,831, Cl. 424-180.000.

Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds. 4,493,833, Cl. 424-246.000.

Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,493,834, Cl. 424-246.000.

Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, to Kabushiki Kaisha Suwa Seikosha; and Takaji Kogya Kabushiki Kaisha. Magnetic head-positioning device for magnetic disc drive. 4,494,159, Cl. 360-78.000.

Takeda Chemical Industries, Ltd.: *See*—
Miyashiro, Yutaka; Ogawa, Masao; Yamazaki, Yoshio; and Igarasi, Seizi, 4,493,894, Cl. 435-178.000.

Takeda, Kazuo: *See*—
Funakoshi, Tadayoshi; and Takeda, Kazuo, 4,493,611, Cl. 415-199.100.

Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Electrically operated fuel pump device. 4,493,620, Cl. 417-366.000.

Takekida, Yoshisuke, to NEC Corporation. Development apparatus of latent electrostatic images. 4,493,550, Cl. 355-10.000.

Takeno, Hidekazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.

Takesako, Yoshinobu: *See*—
Nonomura, Kinzo; Watanabe, Masanori; and Takesako, Yoshinobu, 4,493,666, Cl. 445-24.000.

Takeshita, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Control system in a test device for testing a manual speed change unit. 4,493,209, Cl. 73-118.000.

Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Ikeda, Tadashi; Takeshita, Masatoshi; and Kodama, Naoki, 4,494,216, Cl. 365-36.000.

Takeuchi, Seizi: *See*—
Kahara, Toshiki; Matsuda, Shimpei; Ishii, Kenzo; Takeuchi, Seizi; Imahashi, Jinichi; and Honji, Akio, 4,493,879, Cl. 429-41.000.

Takimoto, Toshiyuki; and Aoki, Keiji, to Toyota Jidosha Kabushiki Kaisha. Electronic fuel injecting method and device for internal combustion engine. 4,493,305, Cl. 123-490.000.

Tallant, James C., II: *See*—
Naimpally, Saiprasad V.; and Tallant, James C., II, 4,494,146, Cl. 358-184.000.

Tamura, Kazuhisa; and Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Vibration damper assembly. 4,493,674, Cl. 464-68.000.

Tamura, Kohki: *See*—
Horiba, Tatsuo; Iwamoto, Kazuo; Kawana, Hidejiro; Fujita, Kazunori; and Tamura, Kohki, 4,493,878, Cl. 429-12.000.

Tamura, Yasuyuki: *See*—
Kaneko, Shuzo; Tamura, Yasuyuki; and Takahashi, Tohru, 4,493,882, Cl. 430-97.000.

Tanabe, Toshio: *See*—
Tanahashi, Masao; Tanabe, Toshio; and Otsuka, Kiyotaka, 4,493,149, Cl. 30-43.920.

Tanahashi, Masao; Tanabe, Toshio; and Otsuka, Kiyotaka, to Matsushita Electric Works, Ltd. Reciprocal blade assembly of electric shaver. 4,493,149, Cl. 30-43.920.

Tanaka, Goro: *See*—
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.

Tanaka, Koji, to Japan Exlan Company Limited. Filter for removing water from water-containing oil and method for the same. 4,493,772, Cl. 210-799.000.

Tanaka, Sumio; and Watanabe, Shigeyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Nonvolatile read only memory device. 4,494,219, Cl. 365-189.000.

Tanaka, Tsutomu: *See*—
Ohmura, Hiroshi; Kohno, Atsuo; Shiiba, Minoru; and Tanaka, Tsutomu, 4,493,542, Cl. 354-82.000.

Tanaka, Yoshitake: *See*—
Omura, Satoshi; Tanaka, Yoshitake; Iwai, Yuzuru; Takahashi, Yoko; and Nakagawa, Akira, 4,493,845, Cl. 424-279.000.

Tandler, Peter: *See*—
Schopper, Bernd; and Tandler, Peter, 4,493,508, Cl. 303-6.00C.

Taniguchi, Seiho; and Sakuma, Yuichiro, to Union Carbide Corporation. Semi-conductive compositions, based on ethylene-vinyl acetate copolymers, having adhesion to and strippability from crosslinked polyolefin substrates. 4,493,787, Cl. 252-511.000.

Tapco Products Company, Inc.: *See*—
Rhoades, James J., 4,493,200, Cl. 72-319.000.

Taschner, Walter: *See*—
Fastner, Thorwald; Mayrhofer, Max; and Taschner, Walter, 4,493,452, Cl. 228-158.000.

Taubitz, Christof: *See*—
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.

Taylor Machine Works, Inc.: *See*—
Walker, Evo M., 4,493,604, Cl. 414-622.000.

Technicare Corporation: *See*—
Robbins, Cheston W.; and Kelly, Robert M., 4,493,653, Cl. 434-262.000.

Teck Corporation: *See*—
Bisa, Rudy, 4,493,817, Cl. 423-62.000.

Teijin Limited: *See*—
Ueda, Fumio; Hashimoto, Eiichi; Yamada, Takeyoshi; and Mori, Koh, 4,493,714, Cl. 55-16.000.

Telefonaktiebolaget L M Ericsson: *See*—
Josefsson, Lars G.; Svensson, Bengt T.; and Moeschlin, Lars F., 4,494,083, Cl. 333-33.000.

Telefunken Electronic GmbH: *See*—
Kohn, Erhard, 4,494,132, Cl. 357-30.000.
Maier, Herbert, 4,493,143, Cl. 29-590.000.
Rinderle, Heinz, 4,494,076, Cl. 330-284.000.

Tentelier, Jean: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,493,598, Cl. 414-1.000.

Teplitz, Raymond L.: *See*—
Smith, Lloyd H.; and Teplitz, Raymond L., 4,493,899, Cl. 436-508.000.

Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, to Fujisawa Pharmaceutical Co., Ltd. Certain glycerol-phosphoryl choline derivatives, compositions containing same and method of using same. 4,493,832, Cl. 424-199.000.

Terui, Masumi, to Takara Co., Ltd. Toy vehicle assembly. 4,493,672, Cl. 446-464.000.

Terumo Corporation: *See*—
Sugisawa, Yasuhiko, 4,493,708, Cl. 604-165.000.

Tetra Pak International AB: *See*—
Bernle, Gote L., 4,493,687, Cl. 493-310.000.

Teumer, Roger G.; and Attridge, David M., to Xerox Corporation. Inverter-reverser for a reproduction machine. 4,493,483, Cl. 271-186.000.

Texas Instruments Incorporated: *See*—
Reddy, Chitranjan N.; and Rao, G. R. Mohan, 4,494,223, Cl. 365-233.000.
Simpson, Richard D., 4,494,187, Cl. 364-200.000.
White, Lionel S.; and Rao, G. R. Mohan, 4,494,222, Cl. 365-222.000.

Texpa-Arbter Maschinenbaugesellschaft mbH: *See*—
Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, 4,493,234, Cl. 83-175.000.

Textilma AG: *See*—
Speich, Francisco, 4,493,346, Cl. 139-76.000.

Thakkar, Arvind L.: *See*—
Zimmerman, Ronald E.; Burck, Philip J.; Jones, C. David; and Thakkar, Arvind L., 4,493,699, Cl. 604-55.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,493,702, Cl. 604-80.000.

Thermal Science, Inc.: *See*—
Feldman, Rubin, 4,493,945, Cl. 174-68.00C.

Thermics Corporation Liquidating Trust: *See*—
Ganter, Robert; Whitmoyer, Robert; and Rye, Palle, 4,493,637, Cl. 431-190.000.

Thermo Electron Corporation: *See*—
Hurley, James R.; Searight, Edward F.; and Nunes, Maurice, 4,493,308, Cl. 126-41.00R.

Thermo King Corporation: *See*—
Hanson, Jay L., 4,493,191, Cl. 62-126.000.

Thibault, Alfred R.: *See*—
O'Malley, Michael P.; and Thibault, Alfred R., 4,493,627, Cl. 425-89.000.

Thiele, Heino: *See*—
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.

Thigpen, David R.: *See*—
Reisberg, Joseph; Bielamowicz, Lawrence J.; and Thigpen, David R., 4,493,371, Cl. 166-274.000.

Thomas & Betts Corporation: *See*—
Law, Joseph P., 4,493,522, Cl. 339-94.00C.

Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., to Coulter Systems Corp. Optical system for imaging an electrophotographic member. 4,493,549, Cl. 355-3.00R.

Thomas, John. Nail guide and set. 4,493,353, Cl. 145-46.000.

Thompson, Alan D.: *See*—
Wakeling, Antony J.; and Thompson, Alan D., 4,494,110, Cl. 340-365.00R.

Thompson, David J.: *See*—
Newton, David F.; and Thompson, David J., 4,493,785, Cl. 252-299.100.

Thompson, Lionel D.; Jenkins, Harold E.; Hickerson, Richard A.; and Weaver, Russell E., to Mack Trucks, Inc. Engine control. 4,493,303, Cl. 123-357.000.

Thompson, William L., to Babcock & Wilcox Company, The. Dedicated correlator. 4,494,213, Cl. 364-604.000.

Thomson-CSF: *See*—
Di Forte Poisson, Marie-Antoinette; Hirtz, Jean-Pierre; Duchemin, Jean-Pascal; and de Cremoux, Baudouin, 4,494,237, Cl. 372-45.000.
Gauthier, Francis; and Gombert, Jean, 4,493,720, Cl. 65-3.120.
Palluel, Pierre; and Shroff, Arvind, 4,494,035, Cl. 313-346.00R.
Reymond, Jean-Claude; Bertrand, Gilles; and Gabanou, Roland, 4,494,201, Cl. 364-449.000.
Van Den Driessche, Michel, 4,494,048, Cl. 315-408.000.

Thomson, Ian D. M., to Arbonite Corporation. Coated pipe and method of making same. 4,493,864, Cl. 428-36.000.

Tibbits, John L.: *See*—
Thomas, E. Raymond; Cahill, Lysle D.; Tibbits, John L.; Fraser, Kenneth D.; Keane, John F.; Harting, Stanley C.; Kramer, George H.; Duke, Ronald J.; Kessis, Theodore A.; Butler, John C.; Frank, Gary L.; and Lawson, John A., 4,493,549, Cl. 355-3.00R.

Tiberg, Lars: *See*—
Fredriksson, Hasse; and Tiberg, Lars, 4,493,363, Cl. 164-476.000.

Tighe, Brian J.; and Gee, Howard J., to Kelvin Lenses Limited. Fluorine-containing hydrogel-forming polymeric materials. 4,493,910, Cl. 523-108.000.

Tincher, Cline A.: *See*—
Schwartz, Ellen S.; and Tincher, Cline A., 4,493,780, Cl. 252-73.000.

Todo, Eishiro: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,493,832, Cl. 424-199.000.

Todoh, Hidemasa, to Fuji Xerox Co., Ltd. Thermal recording head drive device. 4,494,126, Cl. 346-76.0PH.

Tokunaga, Toshihide: *See*—
Kajioka, Hiroshi; Tokunaga, Toshihide; and Nakagawa, Junkichi, 4,493,530, Cl. 350-96.340.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ikekame, Hiroo; and Karasawa, Yasuo, 4,494,173, Cl. 361-429.000.
Inokuchi, Haruhisa; and Sakai, Takami, 4,494,179, Cl. 363-35.000.
Konishi, Satoshi, 4,494,020, Cl. 307-530.000.
Kubo, Osamu; Ido, Tadashi; Nomura, Tutomu; and Maeda, Tatsumi, 4,493,874, Cl. 428-403.000.
Nishizawa, Hiroshi; Sato, Tadayuki; and Ishikawa, Takashi, 4,493,858, Cl. 427-104.000.
Seki, Eiji; Tai, Ichiro; Shirayama, Shimpey; Itoh, Toshiaki; Endo, Yorimasa; and Fukushima, Toshiki, 4,493,811, Cl. 376-254.000.
Tanaka, Sumio; and Watanabe, Shigeyoshi, 4,494,219, Cl. 365-189.000.

Yamamoto, Masao; Yebisuya, Takashi; Kawai, Mituo; and Tajima, Koichi, 4,493,733, Cl. 75-126.00B.
Yoshihisa, Kozo; and Okui, Isamu, 4,494,075, Cl. 330-254.000.
Tolliver, Peter M. Lateral view extender device. 4,493,538, Cl. 351-57.000.
Tonne, Peter: *See*—
Jaedicke, Hagen; and Tonne, Peter, 4,493,802, Cl. 260-507.00R.
Tonoki, Satoshi: *See*—
Hirobe, Kazushi; Tonoki, Satoshi; and Nishigaki, Masahiko, 4,493,913, Cl. 523-205.000.
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, to Eszakmagyarorszagi Vegyimuvek. Plant growth regulating method. 4,493,727, Cl. 71-088.000.
Toth, William D., to Pitney Bowes Inc. Mailing machine tape knife. 4,493,236, Cl. 83-440.100.
Toung, Wen H. Collapsible globe assembly. 4,493,649, Cl. 434-138.000.
Tourre, Bernard: *See*—
Ohayon, Gerard; Reverchon, Bernard; Tourre, Bernard; and Vigier, Serge, 4,493,271, Cl. 110-262.000.
Tovey, Geoffrey D., to Smith Kline & French Laboratories Limited. Dosage units. 4,493,822, Cl. 424-15.000.
Townson, Jimmy D., to Freeman, Kenneth A. Hydraulic straight hole drill collar. 4,493,380, Cl. 175-61.000.
Toyo Kasei Kogyo Co., Ltd.: *See*—
Shimamoto, Kunihiro; Hatanaka, Hiroshi; Seki, Shinichiro; and Orita, Ryozo, 4,493,938, Cl. 568-62.000.
Toyoda Gosei Co., Ltd.: *See*—
Hori, Yoshimi; Ishida, Takashi; and Hayashi, Keizo, 4,493,632, Cl. 425-393.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,493,804, Cl. 261-44.00C.
Takimoto, Toshiyuki; and Aoki, Keiji, 4,493,305, Cl. 123-490.000.
Yamawaki, Takeshi; and Nishiyama, Kunio, 4,493,505, Cl. 296-63.00C.
Tra, Josef: *See*—
Musselmann, Walter; Kinzler, Herbert; and Tra, Josef, 4,493,766, Cl. 209-362.000.
Travis, James, to University of Georgia Research Foundation, Inc. Determination of oxidized α-1-proteinase inhibitor in serum or plasma. 4,493,891, Cl. 435-23.000.
Treacy, Richard H.: *See*—
Godfrey, Noel R.; Parkes, Larry S.; and Treacy, Richard H., 4,494,050, Cl. 318-158.000.
Treat, Michael R. Bipolar electrocautery surgical snare. 4,493,320, Cl. 128-303.150.
Trenholm, Bruce W.; and Woolley, James G., to United States of America, Navy. Riser. 4,493,466, Cl. 244-152.000.
TRI Tool, Inc.: *See*—
Nall, Lawson H., 4,493,232, Cl. 82-4.00C.
Trindium Corporation of America: *See*—
Adams, William R., 4,493,736, Cl. 148-2.000.
Trinh, Lanh T.; and Loy, Robert W., to Bendix Corporation, The. Advance control for breakerless ignition system. 4,493,307, Cl. 123-630.000.
Trivette, Chester D., Jr., to Monsanto Company. Rubber compositions and method for treating rubber with hydroxymethyl sulfinic salts. 4,493,925, Cl. 525-353.000.
Troebs, Charles J.: *See*—
Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., 4,493,572, Cl. 400-196.100.
Troy, Seymour; and Mullenix, Kenneth E. Automatic lottery system. 4,494,197, Cl. 364-412.000.
Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,494,204, Cl. 364-470.000.
TRW Inc.: *See*—
Bergin, Thomas F., 4,493,616, Cl. 417-53.000.
Miller, Laurence L., 4,493,622, Cl. 418-57.000.
Tsunehiro, Takashi: *See*—
Noguchi, Kouki; Tsunehiro, Takashi; and Nakamura, Hideo, 4,494,195, Cl. 364-200.000.
Tsutsumi, Hideo: *See*—
Takaya, Takao; Yasuda, Nobuyoshi; Tsutsumi, Hideo; and Matsuda, Keiji, 4,493,831, Cl. 424-180.000.
Turner, Jonathan S., to AT&T Bell Laboratories. Fast packet switching system. 4,494,230, Cl. 370-60.000.
Tuzzolino, Joseph R.: *See*—
Dydyk, Michael; Enlow, Norman K.; and Tuzzolino, Joseph R., 4,494,087, Cl. 331-107.0DP.
TX RX Systems, Inc.: *See*—
Kaegebein, Daniel P., 4,493,422, Cl. 211-26.000.
Uclaf, Roussel: *See*—
Nedelec, Lucien; Pierdet, Andre ; and Fauveau, Patrick, 4,493,836, Cl. 424-248.400.
Ueberwolf, Heinz: *See*—
Schwarzenberg, Norbert; Ueberwolf, Heinz; Halberschmidt, Friedrich; and Audi, Joseph, 4,493,724, Cl. 65-273.000.
Ueda, Fumio; Hashimoto, Eiichi; Yamada, Takeyoshi; and Mori, Koh, to Teijin Limited. Ultrathin film, process for production thereof, and use thereof for concentrating a specified gas in a gaseous mixture. 4,493,714, Cl. 55-16.000.
Uematsu, Kimio, to Nippon Kogaku K.K. Focal-plane shutter. 4,493,544, Cl. 354-246.000.
Ueno, Yukichi: *See*—
Shibata, Atsushi; and Ueno, Yukichi, 4,494,005, Cl. 250-492.200.
Ueyama, Tamotsu; and Yamada, Takao, to Hitachi Chemical Company, Ltd. Electroconductive paste and process for producing electroconductive metallized ceramics using the same. 4,493,789, Cl. 252-514.000.
Uldall, Peter R., to Allentyne Limited. Hemodialysis cannular for subclavian insertion. 4,493,696, Cl. 604-43.000.
Umeda, Hiroyuki: *See*—
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,494,161, Cl. 360-132.000.
Umemura, Yukio, to Nissan Motor Co., Ltd. Cooling system of V-type internal combustion engine. 4,493,294, Cl. 123-41.330.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,493,676, Cl. 464-141.000.
Union Carbide Corporation: *See*—
Rifi, Mahmoud R., 4,493,924, Cl. 525-102.000.
Taniguchi, Seiho; and Sakuma, Yuichiro, 4,493,787, Cl. 252-511.000.
Urbutis, Algimantas P.; and Jagel, Peter H., 4,493,130, Cl. 17-49.000.
Uniroyal, Inc.: *See*—
Wefer, John M., 4,493,921, Cl. 525-67.000.
Uniset Corporation: *See*—
Kopf, Rowland J., 4,493,376, Cl. 173-139.000.
United Kingdom Atomic Energy Authority: *See*—
Peck, Peter F., 4,494,001, Cl. 250-358.100.
Roach, Peter F., 4,493,214, Cl. 73-779.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., 4,494,133, Cl. 357-30.000.
United States Borax & Chemical Corporation: *See*—
von Buelow, John; and Hauser, Stephen G., 4,493,440, Cl. 222-109.000.
United States of America
Agriculture: *See*—
Friedrich, John P.; and Eldridge, Arthur C., 4,493,854, Cl. 426-629.000.
Air Force: *See*—
Cannon, Mark W., Jr., 4,493,539, Cl. 351-205.000.
Army: *See*—
Bass, Alva W., 4,493,581, Cl. 403-323.000.
Ducote, Marjorie E.; and Allen, Henry C., 4,493,741, Cl. 149-19.400.
Goll, Jeffrey H., 4,494,091, Cl. 333-151.000.
Gualtieri, John G.; and Vig, John R., 4,493,991, Cl. 250-203.00R.
Gutleber, Frank S., 4,494,228, Cl. 370-18.000.
Hager, Adolph G.; Freeman, Gerald L.; Rush, James P.; Branovich, Louis E.; and DuBuske, Stanley, 4,494,003, Cl. 250-474.100.
Jameson, Robert L., 4,493,264, Cl. 102-491.000.
Klayman, Daniel L.; Scovill, John P.; Bartosevich, Joseph F.; Mason, Carl J.; and Griffin, T. Scott, 4,493,930, Cl. 544-360.000.
Light, David O., Jr.; Hayes, Frank, III; and McGinty, Joseph R., 4,494,079, Cl. 331-1.00A.
Energy: *See*—
Banker, John G., 4,493,737, Cl. 148-11.50R.
Brak, Stephen B., 4,493,179, Cl. 53-576.000.
Christiansen, David W.; and Schively, Dixon P., 4,493,812, Cl. 376-352.000.
Haldipur, Gaurang B.; Anderson, Richard G.; and Cherish, Peter, 4,493,636, Cl. 431-170.000.
Lee, David M.; and Lindquist, Lloyd O., 4,493,810, Cl. 376-254.000.
Maples, Robert A., 4,494,002, Cl. 250-377.000.
Moretti, Alfred, 4,494,040, Cl. 315-5.410.
National Aeronautics and Space Administration: *See*—
Korb, Charles L.; and Kalshoven, James E., Jr., 4,493,553, Cl. 356-43.000.
Weinstein, Leonard M., 4,493,211, Cl. 73-147.000.
Navy: *See*—
Coleman, H. Paris, 4,494,117, Cl. 343-365.000.
Coleman, Jeffrey L., 4,493,281, Cl. 114-20.00R.
Dale, John R., 4,493,664, Cl. 441-7.000.
Foster, John S., 4,493,260, Cl. 102-307.000.
Gholson, Norman H., 4,494,115, Cl. 340-825.650.
Groutage, Frederick D.; Conjerti, Samuel N.; and Shaw, Lockburn S., 4,493,136, Cl. 24-573.000.
Henry, John W., IV, 4,493,514, Cl. 384-613.000.
Hughes, Richard S., 4,494,084, Cl. 333-81.00R.
Hutcheson, Don S., 4,493,262, Cl. 102-363.000.
Kim, Kyung J., 4,494,039, Cl. 315-4.000.
Pedersen, Marvin A., 4,493,239, Cl. 89-1.130.
Schwartz, Jay W., 4,494,211, Cl. 364-571.000.
Trenholm, Bruce W.; and Woolley, James G., 4,493,466, Cl. 244-152.000.
Zalesak, Philip F.; and Moore, Ronald D., 4,493,195, Cl. 62-402.000.
U.S. Philips Corporation: *See*—
Auwerda, Cornelis P.; and Koel, Gerrit J., 4,493,721, Cl. 65-3.120.
Bakker, Jan, 4,494,160, Cl. 360-129.000.
Barnes, Christopher S.; Moore, Paul A.; and White, Philip D., 4,494,031, Cl. 310-313.00B.

de Vries, Gerhard H. F., 4,494,037, Cl. 313-584.000.
Lenders, Wilhelmus L. L., 4,494,097, Cl. 335-213.000.
Moussie, Michel, 4,494,135, Cl. 357-59.000.
Ortega, Francis, 4,493,365, Cl. 165-10.00A.
Peeters, Winfried L.; Ponjee, Johannes J.; and Martens, Jan W. D., 4,493,887, Cl. 430-275.000.
Pelletier, Joel A.; and Breuillard, Robert, 4,494,014, Cl. 307-254.000.
Prijs, Pieter R., 4,494,099, Cl. 335-299.000.
van Vroonhoven, Casper E. G. M. M.; and van Wijk, Keimpe, 4,494,227, Cl. 369-147.000.

United States Surgical Corporation: *See*—
Hill, Jeremy R.; and Malinouskas, Donald, 4,493,326, Cl. 128-680.000.

United Technologies Corporation: *See*—
D'Anna, Frank P., 4,493,612, Cl. 416-20.00R.
Hansen, Kenneth P., 4,493,187, Cl. 60-39.281.
Nikkanen, John P.; and Griffin, James G., 4,493,184, Cl. 60-204.000.

Universal Pioneer Corporation: *See*—
Akiyama, Toru, 4,494,154, Cl. 358-342.000.

University of Georgia Research Foundation, Inc.: *See*—
Travis, James, 4,493,891, Cl. 435-23.000.

University of Iowa Research Foundation: *See*—
Albright, John P.; Martin, Robert K.; and Dyson, John A., 4,493,323, Cl. 128-340.000.

University Patents, Inc.: *See*—
Lauks, Imants R., 4,493,886, Cl. 430-270.000.

Uno, Takeshi: *See*—
Shima, Yoshihiro; Kashioka, Seiji; Uno, Takeshi; and Suzuki, Kunio, 4,494,139, Cl. 358-101.000.

Urbutis, Algimantas P.; and Jagel, Peter H., to Union Carbide Corporation. Shirred casing article method and apparatus. 4,493,130, Cl. 17-49.000.

Uretsky, Yan S.; Mnekin, Ravil V.; Rygalin, Viktor G.; Grechinsky, Dmitry A.; and Klochko, Viktor A., to Nauchno-Issledovatelsky Institut Introskopii; and Kazansky Aviatsionny Institut Imeni A. N Tupoleva. Random vibrations testing device. 4,493,213, Cl. 73-664.000.

Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Parenteral administration using osmotically motivated delivery system. 4,493,702, Cl. 604-80.000.

Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; Mimura, Yoshiki; and Shimizu, Hiroshi, 4,493,977, Cl. 219-411.000.

UTB Umwelttechnik Buchs AG: *See*—
Moilliet, Guy, 4,493,770, Cl. 210-603.000.

Uy, William C. Scraping brush. 4,493,126, Cl. 15-186.000.

Uyeda, Tim, to La Gard, Inc. Universal boltworks mechanism for safe door. 4,493,199, Cl. 70-333.00R.

Uzuo, Takeshi: *See*—
Sugimoto, Hachiro; Hamano, Sachiyuki; Shoji, Tadao; Kaneko, Takeru; and Uzuo, Takeshi, 4,493,837, Cl. 424-253.000.

V M E I "Lenin": *See*—
Vassilev, Vassil B.; and Sofiyanski, Vassil M., 4,494,078, Cl. 330-297.000.

Vajda, Gabor; Ravasz, Laszlo ; Karacsonyi, Bela; and Tabajdi, Gabor, to Kozponti Valto- es Hitelbank RT. Innovacios Alap. Chocolate products with increased protein content and process for the production of such type products. 4,493,853, Cl. 426-582.000.

Valenti, Edward R.; Adamczyk, Thomas J.; and Graham, Larry W., to Alden Press, Inc. Motion stabilizing and aligning apparatus for moving folded signatures through an ink jet printer. 4,493,482, Cl. 270-12.000.

Valle, Ronald. Method of inducing sleep. 4,493,827, Cl. 424-166.000.

Vandenbergh, Peter A.: *See*—
Colaruotolo, Joseph F.; Olsen, Ronald H.; and Vandenbergh, Peter A., 4,493,895, Cl. 435-262.000.

Van Den Driessche, Michel, to Thomson-CSF. Scanning control circuit for a television receiver, with gradual startup. 4,494,048, Cl. 315-408.000.

van der Kolk, Donald. Continuous pet litter cleaning apparatus. 4,493,288, Cl. 119-1.000.

Van Huis, Philip J.: *See*—
Moore, James I.; and Van Huis, Philip J., 4,493,362, Cl. 164-457.000.

Van Ocker, William G.; Pawlenko, Ivan; Reider, Donald F.; Troebs, Charles J.; Clair, Robert A.; and Crandall, Stanley C., to Avery International Corp. Long-life inked-ribbon cassette. 4,493,572, Cl. 400-196.100.

van Os, Rudi, to Koninklijke Nederlandse Papierfabrieken N.V. Method and apparatus for removing condensate from a cylinder, in particular a cylinder for drying paper. 4,493,158, Cl. 34-41.000.

Van Patten, Preston J. Safety lowering device. 4,493,391, Cl. 182-6.000.

Vansteelant, Marc G., to Sperry Corporation. Knotter with an improved Geneva mechanism. 4,493,498, Cl. 289-2.000.

van Vroonhoven, Casper E. G. M. M.; and van Wijk, Keimpe, to U.S. Philips Corporation. Stereo phono pick-up and/or cutter. 4,494,227, Cl. 369-147.000.

van Wijk, Keimpe: *See*—
van Vroonhoven, Casper E. G. M. M.; and van Wijk, Keimpe, 4,494,227, Cl. 369-147.000.

Varo, Inc.: *See*—
Blaske, T. Allen; and Hendricks, Terry J., 4,493,939, Cl. 136-212.000.

Varpaja Oy: *See*—
Rautakoura, Timo, 4,493,579, Cl. 403-237.000.

Vassilev, Vassil B.; and Sofiyanski, Vassil M., to V M E I "Lenin". Class BC power amplifier. 4,494,078, Cl. 330-297.000.

Vath, Joachim: *See*—
Koszytorz, Gunther; Lucke, Herbert; Schlosser, Gerhard; and Vath, Joachim, 4,493,990, Cl. 250-201.000.

Vaught, John L., to Hewlett-Packard Company. Gray scale printing with ink jets. 4,494,128, Cl. 346-140.00R.

Veber, Daniel F.; and Freidinger, Roger M., to Merck & Co., Inc. 2(3-Amino-2-oxopyrrolidin-1-yl) acetic acid and n-acylated derivatives thereof. 4,493,934, Cl. 548-550.000.

Veillard, Dominique H., to Eastman Kodak Company. Adaptive redundance in data recording. 4,494,155, Cl. 360-47.000.

Verdal Maskinverksted A/S: *See*—
Ekman, Heinz, 4,493,366, Cl. 165-54.000.

Vereinigte Flugtechnische Werke GmbH: *See*—
Engel, Hinrich, 4,493,470, Cl. 248-503.100.

Vesperman, William C.: *See*—
Kanotz, William M.; Vesperman, William C.; and Wilson, Max K., 4,493,747, Cl. 156-64.000.

Victor Company of Japan, Ltd.: *See*—
Kokufukata, Seigo; and Sekido, Tetsuya, 4,494,145, Cl. 358-163.000.
Ogata, Haruki; Ogawa, Kimio; and Umeda, Hiroyuki, 4,494,161, Cl. 360-132.000.

Victor Hasselblad Aktiebolag: *See*—
Lundberg, Jan A.; Wallgren, Goran T. L.; and Martinsson, Mats H., 4,493,543, Cl. 354-109.000.

Viebrantz, Hans-Joachim, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf., GmbH & Co. Keyboard with improved key design permitting tilting about either side. 4,493,959, Cl. 200-340.000.

Vig, John R.: *See*—
Gualtieri, John G.; and Vig, John R., 4,493,991, Cl. 250-203.00R.

Vigh, Laszlo : *See*—
Toth, Istvan; Nagy, Jozsef; Dombay, Zsolt; Grega nee Toth, Erzsebet; Horvath, Ibolya; Vigh, Laszlo ; and Farkas, Tibor, 4,493,727, Cl. 71-088.000.

Vigier, Serge: *See*—
Ohayon, Gerard; Reverchon, Bernard; Tourre, Bernard; and Vigier, Serge, 4,493,271, Cl. 110-262.000.

Voest-Alpine Aktiengesellschaft: *See*—
Fastner, Thorwald; Mayrhofer, Max; and Taschner, Walter, 4,493,452, Cl. 228-158.000.

Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Driving device for twisting heads of an SZ twisting machine. 4,493,182, Cl. 57-293.000.

Vogt, Max: *See*—
Weil, Wolfgang; Lanz, Andres; Vogt, Max; Meier, Paul; Kaul, Martin; and Fankhauser, Hanspeter, 4,493,962, Cl. 219-64.000.

Voltmer, Helmut; Schwenzer, Alfred F.; and Spano, John D., to NJM, Inc. Labeling machines. 4,493,744, Cl. 156-568.000.

von Buelow, John; and Hauser, Stephen G., to United States Borax & Chemical Corporation. Wall-mounted soap dispenser. 4,493,440, Cl. 222-109.000.

Vrouenraets, Cornelius M. F.; and Sikkema, Doetze J., to Akzo nv. Flexible layered product. 4,493,870, Cl. 428-245.000.

Vukovich, William J.; and Grimes, Michael R., to General Motors Corporation. Throttle control system for an automatic shift countershaft transmission. 4,493,228, Cl. 74-858.000.

Vyas, Arvindkumar C., to NCR Canada Ltd. - NCR Canada Ltee. Variable impact printing means. 4,493,253, Cl. 101-93.030.

Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, to BASF Aktiengesellschaft. Process for producing sheet-like structures from vinyl alcohol polymers. 4,493,807, Cl. 264-101.000.

W.E.F.C.O., Inc.: *See*—
Langan, Ervin C.; and Christie, Howard W., 4,493,162, Cl. 47-57.600.

W. H. Brady Co.: *See*—
Wirth, Gary J., 4,493,446, Cl. 225-21.000.

W. L. Gore & Associates, Inc.: *See*—
Swick, Robert H., 4,493,716, Cl. 55-158.000.

W. R. Grace & Co., Cryovac Div.: *See*—
Bolton, Roderick A., 4,493,684, Cl. 493-234.000.

WABCO Fahrzeugbremsen GmbH: *See*—
Deike, Karl-Heinz; Schulz, Hans-Joachim; and Sandmann, Jurgen, 4,493,510, Cl. 303-28.000.
Stillfried, Rudiger F. V.; Seegers, Gunter; and Sebesta, Gunter, 4,493,244, Cl. 91-420.000.

WABCO Westinghouse Equipements Ferroviaires: *See*—
Dalibout, Georges, 4,493,246, Cl. 92-13.800.

Wachsman, Mordechai, to Amcor Ltd. Apparatus for improvement of air quality in passenger airplane cabins. 4,493,247, Cl. 98-1.000.

Wade, John F.: *See*—
Wallschlaeger, Alan R.; and Wade, John F., 4,493,258, Cl. 101-415.100.

Wagner, Richard P. Method and apparatus for door protection. 4,493,164, Cl. 49-65.000.

Waigand, Helmut: *See*—
Bredel, Walter; Schenetin, Norbert; and Waigand, Helmut, 4,493,979, Cl. 219-446.000.

Wakashima, Yoshiaki: *See*—
Suzuki, Hiroshi; Tanaka, Goro; Nishikawa, Akio; Mukai, Junji; Sato, Mikio; Makino, Daisuke; and Wakashima, Yoshiaki, 4,494,217, Cl. 365-53.000.

Wakeling, Antony J.; and Thompson, Alan D., to Schlumberger Electronic (U.K.) Ltd. Keyboard modules for use in data terminals. 4,494,110, Cl. 340-365.00R.

Walker, Evo M., to Taylor Machine Works, Inc. Fork lift clamp apparatus. 4,493,604, Cl. 414-622.000.

Walker, John S.: *See*—
Moore, Larry A.; and Walker, John S., 4,494,123, Cl. 343-900.000.

Wallace, Harvey W.: *See*—
Lew, Eugene K.; and Wallace, Harvey W., 4,494,192, Cl. 364-200.000.

Wallace, Robert S., to M. Bosley Wright. Lock-up corner bracket for frame parts. 4,493,583, Cl. 403-402.000.

Wallat, Siegfried: *See*—
Moller, Hinrich; Wallat, Siegfried; Bartnik, Friedhelm; and Pittermann, Wolfgang, 4,493,823, Cl. 424-70.000.

Wallgren, Goran T. L.: *See*—
Lundberg, Jan A.; Wallgren, Goran T. L.; and Martinsson, Mats H., 4,493,543, Cl. 354-109.000.

Wallroth, Carl F.: *See*—
Mohr, Helmut; Falb, Wolfgang; and Wallroth, Carl F., 4,493,318, Cl. 128-200.190.

Wallschlaeger, Alan R.; and Wade, John F., to Rockwell International Corporation. Interfacing cam and toggle lockup. 4,493,258, Cl. 101-415.100.

Walsh, Jack. Modular page composition system. 4,493,552, Cl. 355-75.000.

Waltec, Inc.: *See*—
Petursson, Sigurdur G., 4,493,338, Cl. 137-454.200.

Walter, Carlton H.; Bohley, Peter; and Couture, Robert P., to Interstate Electronics Corporation. Direction finding antenna. 4,494,121, Cl. 343-708.000.

Wang, Carl C. T.; Charles, Steve; and Buckingham, Joseph T., to Cooper Medical Devices. Method of performing opthalmic surgery utilizing a linear intra-ocular suction device. 4,493,698, Cl. 604-51.000.

Wang Laboratories, Inc.: *See*—
Greer, Michael T., 4,494,196, Cl. 364-200.000.

Wang, Ta-Lung. Simultaneous following means for driver and follower in a toy car. 4,493,670, Cl. 446-288.000.

Ward, John M., to Shell Oil Company. Internal pipeline plug for deep subsea operations. 4,493,589, Cl. 405-166.000.

Warner Electric Brake & Clutch Company: *See*—
Newton, Paul P., 4,493,407, Cl. 192-84.00C.

Warner-Lambert Company: *See*—
Carroll, Thomas J.; Rubin, Michael; Piccolo, Dominic J.; and Glass, Michael, 4,493,849, Cl. 426-3.000.

Warren, Steven M.: *See*—
Kilner, Jerome R.; Raymond, Eugene T.; and Warren, Steven M., 4,493,509, Cl. 303-13.000.

Watanabe, Kiyohiko: *See*—
Takei, Toshihiro; Matsui, Kazuma; Hattori, Yoshiyuki; Watanabe, Kiyohiko; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,493,620, Cl. 417-366.000.

Watanabe, Masanori: *See*—
Nonomura, Kinzo; Watanabe, Masanori; and Takesako, Yoshinobu, 4,493,666, Cl. 445-24.000.

Watanabe, Shigeyoshi: *See*—
Tanaka, Sumio; and Watanabe, Shigeyoshi, 4,494,219, Cl. 365-189.000.

Watney, Dale K.: *See*—
Houchens, Albert F.; Cleveland, Dixon; Decina, Basil A., Jr.; Watney, Dale K.; Havens, James R.; and Nagel, Gregory L., 4,493,965, Cl. 219-109.000.

Watson, Richard R., to Gilmore Valve Company. Shear valve. 4,493,335, Cl. 137-116.300.

Watson, William A., to Rogers Corporation. Decoupling capacitor and method of manufacture thereof. 4,494,169, Cl. 361-306.000.

Watters, Wayde H., to Red Dot Corporation. Multimodal pressure switch. 4,493,957, Cl. 200-81.00R.

Watts, David. Playpen. 4,493,120, Cl. 5-99.00B.

Weaver, Russell E.: *See*—
Thompson, Lionel D.; Jenkins, Harold E.; Hickerson, Richard A.; and Weaver, Russell E., 4,493,303, Cl. 123-357.000.

Webster, Sherwood F.: *See*—
Olmsted, James F.; Webster, Sherwood F.; and Heise, Richard L., 4,493,750, Cl. 159-48.100.

Wedding, Donald K.; Fein, Michael E.; Ernsthausen, Roger E.; and Byrum, Bernard J., to Owens-Illinois, Inc. Gas discharge device. 4,494,038, Cl. 313-587.000.

Wedge, Philip J.; and Bridson, Robert C., to British Gas Corporation. Fuel fired heating element. 4,493,309, Cl. 126-91.00A.

Wefer, John M., to Uniroyal, Inc. Impact resistant blend. 4,493,921, Cl. 525-67.000.

Weil, Wolfgang; Lanz, Andres; Vogt, Max; Meier, Paul; Kaul, Martin; and Fankhauser, Hanspeter. Apparatus and method to suppress oxidation during resistance welding. 4,493,962, Cl. 219-64.000.

Weinstein, Leonard M., to United States of America, National Aeronautics and Space Administration. Continuous laminar smoke generator. 4,493,211, Cl. 73-147.000.

Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Hydraulic coupling. 4,493,340, Cl. 137-594.000.

Weis, Rudolf R.: *See*—
Schutz, Rudolph W.; and Weis, Rudolf R., 4,493,159, Cl. 34-43.000.

Welburn, David J.: *See*—
Simon, James R.; and Welburn, David J., 4,493,261, Cl. 102-331.000.

Welschof, Hans-Heinrich; and Beier, Rudolf, to Lohr & Bromkamp GmbH. Bearing assembly for a vehicle wheel driven by a rotary constant velocity universal joint. 4,493,388, Cl. 180-258.000.

Wenker, Wayne B., to Eaton Corporation. Hydraulic gerotor motor and parking brake for use therein. 4,493,404, Cl. 192-4.00A.

Weppelman, Roger M.: *See*—
Leung, Frederick; and Weppelman, Roger M., 4,493,828, Cl. 424-177.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Munzel, Klaus, 4,493,259, Cl. 102-218.000.

Werner, John A., to Dow Chemical Company, The. Chlorine exchange for fluorine in 2-fluoro-pyridine compounds. 4,493,932, Cl. 546-345.000.

Westfalia Separator AG: *See*—
Beikel, Alfons G.; and Jarosch, Harald, 4,493,350, Cl. 141-65.000.

Westinghouse Brake and Signal Co. Ltd.: *See*—
Wickham, David J., 4,493,511, Cl. 303-36.000.

Westinghouse Electric Corp.: *See*—
Beard, Charles L., Jr.; and Camden, Thomas M., 4,493,814, Cl. 376-428.000.
Gibbs, Richard D.; and Johnson, Roger C., 4,493,138, Cl. 29-33.00Q.
Mulach, Arthur; and Calfo, Raymond, 4,494,030, Cl. 310-256.000.
Wolfe, Donald L., 4,493,967, Cl. 219-121.0LC.

Weyerich, Manfred: *See*—
Buchschmid, Emil; Horn, Friedrich; Nieberl, Bruno; Schmidt, Hans-Jorg; and Weyerich, Manfred, 4,494,101, Cl. 336-210.000.

Wheeler, Lionel H.; Goekler, Robert G.; and Luddeke, Daniel G., to Crutcher Resources Corporation. Resilient internal mandrel. 4,493,203, Cl. 72-369.000.

White, Allan E.; Coleman, David E.; and Miller, Steven R., to RCA Corporation. Statistical teaching apparatus. 4,493,651, Cl. 434-188.000.

White, Anthony M.: *See*—
Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., 4,494,133, Cl. 357-30.000.

White, Lionel S.; and Rao, G. R. Mohan, to Texas Instruments Incorporated. Processor system using on-chip refresh address generator for dynamic memory. 4,494,222, Cl. 365-222.000.

White, Philip D.: *See*—
Barnes. Christopher S.; Moore, Paul A.; and White, Philip D., 4,494,031, Cl. 310-313.00B.

Whitmoyer, Robert: *See*—
Ganter, Robert; Whitmoyer, Robert; and Rye, Palle, 4,493,637, Cl. 431-190.000.

Whitney, Solon G.: *See*—
Hedrick, Harold N.; and Whitney, Solon G., 4,493,907, Cl. 521-26.000.

Wick, Gerald H., to Outboard Marine Corporation. Lawn mower dead man control. 4,493,180, Cl. 56-11.300.

Wicker, Gordon R., to Amax Inc. Method of autogenously drying coal. 4,493,157, Cl. 34-10.000.

Wickham, David J., to Westinghouse Brake and Signal Co. Ltd. Combined BC pressure-maintaining valve and quick service bulb exhaust valve. 4,493,511, Cl. 303-36.000.

Wico Corporation: *See*—
Geller, David A., 4,493,992, Cl. 250-221.000.

Wieland, Heinz, to Wilhelm Gebhardt GmbH. Blower unit for air-conditioning plant. 4,493,341, Cl. 137-597.000.

Wielgus, Charles D., to Colman OEM, Inc. Control mechanism for an electric motor assembly. 4,493,955, Cl. 200-38.00R.

Wiens, Arlen J.: *See*—
Hill, Amos G.; and Wiens, Arlen J., 4,493,601, Cl. 414-491.000.

Wilcox, Thomas J.: *See*—
Arnold, Don C.; and Wilcox, Thomas J., 4,493,343, Cl. 137-625.170.

Wildi, Eric J.; and Adler, Michael S., to General Electric Company. High voltage semiconductor devices comprising integral JFET. 4,494,134, Cl. 357-43.000.

Wiley, John D.: *See*—
Perepezko, John H.; and Wiley, John D., 4,494,136, Cl. 357-67.000.

Wilhelm Gebhardt GmbH: *See*—
Wieland, Heinz, 4,493,341, Cl. 137-597.000.

Willi Becker Ingenieurburo GmbH: *See*—
Becker, Willi; and Johannsen, Karl, 4,493,660, Cl. 440-67.000.

William Prym Werke KG: *See*—
Fischer, Albert J., 4,493,275, Cl. 112-105.000.

Williams, Claude E.; and Gates, F. Alan. Wheel chair lift apparatus. 4,493,603, Cl. 414-541.000.

Williams, Donald F. Adjustable expandable slip-on canoe back rest. 4,493,285, Cl. 114-363.000.

Williams, Frank. Blanket lifting device. 4,493,121, Cl. 5-505.000.

Williams, Gerald J. Three cycle engine with varying combustion chamber volume. 4,493,296, Cl. 123-55.0AA.

Williams, Gerald M.: *See*—
Dean, Anthony B.; Farrow, Robin F. C.; Migliorato, Piero; White, Anthony M.; and Williams, Gerald M., 4,494,133, Cl. 357-30.000.

Williams, Robert E., Jr.; and Campbell, John R., to General Electric Company. Dissociating ionically cross-linked siloxane polymers. 4,493,926, Cl. 525-474.000.

Williams, Robert M.; and Davis, Bob, to Bull Dog Tool Inc. Well clean out tool. 4,493,383, Cl. 175-234.000.

Williams, Theodore F.: *See*—
Piatt, Michael J.; and Williams, Theodore F., 4,494,124, Cl. 346-1.100.

Williamsburg Packaging Corporation: *See*—
LeDrew, Robert B., 4,493,453, Cl. 229-17.00B.

Williamson, Stanley C., to Amchem Products, Inc. Cleansing compositions comprising ethoxylated alcohol monoesters of phosphoric acid. 4,493,782, Cl. 252-95.000.

Willis, Robert: *See*—
Murrin, Byran; Willis, Robert; and Page, Jeffrey, 4,493,758, Cl. 204-224.00R.

Wilson, Arthur C., to General Electric Company. Pyrolytic oven cleaning system. 4,493,976, Cl. 219-398.000.

Wilson, David A.; and Wilson, Wilfred W., to Dow Chemical Company, The. Scale inhibiting with compounds containing quaternary ammonium and methylenephosphonic acid groups. 4,493,771, Cl. 210-700.000.

Wilson, Max K.: *See*—
Kanotz, William M.; Vesperman, William C.; and Wilson, Max K., 4,493,747, Cl. 156-64.000.

Wilson, Wilfred W.: *See*—
Wilson, David A.; and Wilson, Wilfred W., 4,493,771, Cl. 210-700.000.

Wimbush, Fred, to 122923 Canada Limited. Distress radiolocation method and system. 4,494,119, Cl. 343-457.000.

Windmoller & Holscher: *See*—
Eckelt, Ulrich; and Winnemoller, Alois, 4,493,686, Cl. 493-256.000.

Winnemoller, Alois: *See*—
Eckelt, Ulrich; and Winnemoller, Alois, 4,493,686, Cl. 493-256.000.

Winstead, Maynard R.: *See*—
Dudgeon, Charles D.; and Winstead, Maynard R., 4,493,912, Cl. 523-137.000.

Winter, David C.; Pearson, Michael L.; and Long, John D., to Deere & Company. Method and apparatus for forming and reforming a furrow. 4,493,375, Cl. 172-1.000.

Winter, Hermann: *See*—
Bader, Leonhard; Hermann, Ferdinand; Ruprich, Wilhelm; and Winter, Hermann, 4,493,137, Cl. 29-25.350.

Wintermantel, Klaus; Stockburger, Dieter; and Fuchs, Hugo, to BASF Aktiengesellschaft. Method of separation by fractional crystallization from a liquid mixture. 4,493,719, Cl. 62-532.000.

Wirth, Gary J., to W. H. Brady Co. Multiple roll tape dispenser. 4,493,446, Cl. 225-21.000.

Wisconsin Alumni Research Foundation: *See*—
Perepezko, John H.; and Wiley, John D., 4,494,136, Cl. 357-67.000.

Wisthuff, Scott D.; and Behrmann, Edgar A., to Bendix Corporation, The. Universal joint. 4,493,675, Cl. 464-136.000.

Wittstein, Alan D.: *See*—
McIlwain, Michael E.; Grant, Jonathan F.; Golenko, Zsolt; and Wittstein, Alan D., 4,493,297, Cl. 123-143.00B.

WKR Limited: *See*—
Hillary, Brian, 4,493,517, Cl. 339-42.000.

Wolf, Gerhard D.: *See*—
Sirinyan, Kirkor; Giesecke, Henning; Wolf, Gerhard D.; Ebneth, Harold; and Merten, Rudolf, 4,493,861, Cl. 427-304.000.

Wolfe, Donald L., to Westinghouse Electric Corp. Rigid support for laser machining apparatus. 4,493,967, Cl. 219-121.0LC.

Wolkonsky, Alexander, to Stericric SA. Flask for sterile liquids. 4,493,427, Cl. 215-230.000.

Wolstenholme, Paul P. Storage system for granular materials. 4,493,248, Cl. 98-52.000.

Woo, Edmund P., to Dow Chemical Company, The. Synthesis of succinonitriles. 4,493,799, Cl. 260-465.00H.

Wood, Philip S.: *See*—
Clark, Stephen D.; Wood, Philip S.; and Fell, Peter J., 4,493,451, Cl. 228-119.000.

Wood, Prentice J., to Mead Corporation, The. Basket-style article carrier with medial separator. 4,493,415, Cl. 206-175.000.

Woodard, Ollie C.: *See*—
Mauer, John L., IV; Michail, Michel S.; and Woodard, Ollie C., 4,494,004, Cl. 250-492.200.

Woods, Lee O.; and Haag, Donald L., to General Electric Company. Method of assembling a combination starter-protector device. 4,493,144, Cl. 29-622.000.

Woodworth, Walker P.: *See*—
Bilstad, Arnold C.; Foley, John T.; and Woodworth, Walker P., 4,493,693, Cl. 604-6.000.

Woolley, James G.: *See*—
Trenholm, Bruce W.; and Woolley, James G., 4,493,466, Cl. 244-152.000.

Worley, W. Spencer: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Juergens, Tristan, 4,493,221, Cl. 474-14.000.

Wossner, Hans. Method and device for machining brake disks. 4,493,231, Cl. 82-4.00A.

Wuchinich, David G., to Cooper LaserSonics, Inc. Surgical pre-aspirator. 4,493,694, Cl. 604-22.000.

Wulf, Rudolf: *See*—
Engler, Rolf; and Wulf, Rudolf, 4,493,217, Cl. 73-861.270.

Wurm, Jaroslav: *See*—
Macriss, Robert A.; Wurm, Jaroslav; and Huang, Vincent M., 4,493,364, Cl. 165-1.000.

Wuth, Wolfgang: *See*—
Melcher, Gerhard; and Wuth, Wolfgang, 4,493,732, Cl. 75-24.000.

Xerox Corporation: *See*—
Bell, Alan G.; Lyon, Richard F.; and Borriello, Gaetano, 4,494,021, Cl. 307-591.000.
Billings, Philip A.; and Franks, William S., Jr., 4,494,166, Cl. 361-214.000.
Gruber, Robert J.; Agostine, Doretta; Julien, Paul C.; and Yourd, Raymond A., III, 4,493,883, Cl. 430-110.000.
Liao, Henry H., 4,494,151, Cl. 358-261.000.
Teumer, Roger G.; and Attridge, David M., 4,493,483, Cl. 271-186.000.

Yagi, Taizo, to Horiba, Ltd. Pulse phase modulator/demodulator system. 4,494,089, Cl. 332-14.000.

Yamada Electric Industries Co., Ltd.: *See*—
Yamamoto, Katsumi, 4,493,975, Cl. 219-370.000.

Yamada, Takao: *See*—
Ueyama, Tamotsu; and Yamada, Takao, 4,493,789, Cl. 252-514.000.

Yamada, Takeyoshi: *See*—
Ueda, Fumio; Hashimoto, Eiichi; Yamada, Takeyoshi; and Mori, Koh, 4,493,714, Cl. 55-16.000.

Yamada, Yoneo: *See*—
Fujiwara, Koichi; Sakai, Tomohiko; Yamada, Yoneo; and Higashine, Kazutaka, 4,493,739, Cl. 148-111.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Inoue, Seiji; and Harada, Norimichi, 4,493,656, Cl. 440-2.000.
Iwai, Tomio, 4,493,661, Cl. 440-77.000.
Iwashita, Takashi, 4,493,659, Cl. 440-61.000.
Taguchi, Michihiro, 4,493,662, Cl. 440-83.000.

Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Cooling system for an engine having a plurality of engine units. 4,493,190, Cl. 60-714.000.

Yamamoto, Katsumi, to Yamada Electric Industries Co., Ltd. Hang-up hair dryer. 4,493,975, Cl. 219-370.000.

Yamamoto, Masao; Yebisuya, Takashi; Kawai, Mituo; and Tajima, Koichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Corrosion-resistant non-magnetic steel retaining ring for a generator. 4,493,733, Cl. 75-126.00B.

Yamamura Glass Co., Ltd.: *See*—
Ono, Hiroyuki, 4,493,722, Cl. 65-30.140.

Yamanaka, Minoru: *See*—
Haneda, Hideo; and Yamanaka, Minoru, 4,494,098, Cl. 335-230.000.

Yamaoka, Hiromasa; Iwasa, Yuzaburo; and Matunaga, Kazuhisa, to Hitachi, Ltd. Method and apparatus for self-control in distributed priority collision. 4,494,113, Cl. 340-825.500.

Yamauchi, Koji, to Hitachi, Ltd. Temperature control device for fixing heat source of copying machine. 4,493,984, Cl. 219-501.000.

Yamawaki, Takeshi; and Nishiyama, Kunio, to Toyota Jidosha Kabushiki Kaisha. Rear seat of an automobile. 4,493,505, Cl. 296-63.000.

Yamazaki, Yoshio: *See*—
Miyashiro, Yutaka; Ogawa, Masao; Yamazaki, Yoshio; and Igarasi, Seizi, 4,493,894, Cl. 435-178.000.

Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,493,943, Cl. 174-25.00C.

Yang, Jerry S. C. Kerosene heating stove with temperature and carbonic oxide sensors. 4,493,634, Cl. 431-33.000.

Yano, Shozo; Komoto, Akira; and Fujinaga, Yasuhiro, to Shimadzu Corporation. Electronic counting scale. 4,493,384, Cl. 177-25.000.

Yasuda, Nobuyoshi: *See*—
Takaya, Takao; Yasuda, Nobuyoshi; Tsutsumi, Hideo; and Matsuda, Keiji, 4,493,831, Cl. 424-180.000.
Takaya, Takao; Inoue, Yoshikazu; Yasuda, Nobuyoshi; and Murata, Masayoshi, 4,493,834, Cl. 424-246.000.

Yasui, Shinichiro: *See*—
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; Sugimura, Masao; and Takahashi, Fumitaka, 4,494,116, Cl. 340-995.000.

Yazaki, Takao; and Noro, Masataka, to Mitsubushi Petrochemical Co., Ltd. Stretch film for wrapping and a resin composition therefor. 4,493,867, Cl. 428-161.000.

Yebisuya, Takashi: *See*—
Yamamoto, Masao; Yebisuya, Takashi; Kawai, Mituo; and Tajima, Koichi, 4,493,733, Cl. 75-126.00B.

Yelland, Christopher P.; and Pretorius, Rapha E., to Yelland Engineering (Proprietary) Ltd. Electric switching surge protection. 4,494,163, Cl. 361-56.000.

Yelland Engineering (Proprietary) Ltd.: *See*—
Yelland, Christopher P.; and Pretorius, Rapha E., 4,494,163, Cl. 361-56.000.

Yellin, Tobias O.; and Gilman, David J., to Imperial Chemical Industries PLC; and ICI Americas, Inc. Antisecretory guanidine derivatives, and pharmaceutical compositions containing them. 4,493,840, Cl. 424-269.000.

Yeoman, Richard E. Impact switch. 4,493,956, Cl. 200-61.470.

Yokouchi, Hideya: *See*—
Takayama, Chitoshi; Hirao, Hideo; Yokouchi, Hideya; and Iida, Teruhiko, 4,494,159, Cl. 360-78.000.

Yokoyama, Kazumasa: *See*—
Mizushima, Yutaka; Aihara, Hironaka; Otomo, Susumu; Yokoyama, Kazumasa; Okamoto, Hiroyuki; and Suyama, Tadakazu, 4,493,847, Cl. 424-317.000.

Yoneyama, Tomio: *See*—
Kaneko, Masaharu; Ozawa, Tetsuo; Yoneyama, Tomio; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,493,532, Cl. 350-349.000.

Yonishi, Satoshi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Yonishi, Satoshi; Takeno, Hidekazu; Okada, Satoshi; and Hashimoto, Masashi, 4,493,794, Cl. 260-112.50R.

Yoshida Kogyo K.K.: *See*—
Seki, Fumio, 4,493,448, Cl. 227-119.000.

Yoshida, Tsukasa. Rack assembly apparatus. 4,493,425, Cl. 211-189.000.

Yoshihisa, Kozo; and Okui, Isamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Volume control circuit. 4,494,075, Cl. 330-254.000.

Yoshino, Harumi: *See*—
Kume, Nobuyuki; Yoshino, Harumi; and Nagaoka, Miyuki, 4,494,168, Cl. 361-273.000.

Yourd, Raymond A., III: *See*—
Gruber, Robert J.; Agostine, Doretta; Julien, Paul C.; and Yourd, Raymond A., III, 4,493,883, Cl. 430-110.000.

Yueh, William R., to General Dynamics, Pomona Division. Fourth order predictive, augmented proportional navigation system terminal guidance design with missile/target decoupling. 4,494,202, Cl. 364-462.000.

Yukimoto, Yoshinori; and Mitsui, Kotaro, to Mitsubishi Denki Kabushiki Kaisha. Hetero-face solar cell and method of manufacturing the same. 4,493,941, Cl. 136-255.000.

Yuki, Tex. Method and apparatus for capturing an electrical potential generated by a moving air mass. 4,494,009, Cl. 290-55.000.

Yuzui, Katsutoshi, to Honda Giken Kogyo Kabushiki Kaisha. Welding apparatus for vehicle body of two-wheeled vehicle. 4,493,450, Cl. 228-49.00R.

Zabelka, Jaroslav, to Sulzer Brothers Limited. Gas cooler arrangement. 4,493,291, Cl. 122-7.00R.

Zagranski, Raymond D.: *See*—
Howlett, James J.; and Zagranski, Raymond D., 4,493,465, Cl. 244-17.130.

Zalesak, Philip F.; and Moore, Ronald D., to United States of America, Navy. Air conditioning system with evaporative cooling apparatus. 4,493,195, Cl. 62-402.000.

Zanno, Paul R.; Parliment, Thomas H.; Soukup, Robert J.; and McNaught, Richard P., to General Foods Corporation. 1,1-Bis (thioalkyl) alkyl-2,4-diene as a flavoring agent. 4,493,852, Cl. 426-535.000.

Zeitler, Ernst. Device for converting a cycle into a treadle-operated water cycle. 4,493,657, Cl. 440-27.000.

Zenith Electronics Corporation: *See*—
Lange, Howard G.; and Ray, Francis M., 4,493,166, Cl. 51-100.00R.

Ziegler, Hans; Henze, Siegfried; Dippert, Rainer; Schnaus, Martin; and Golda, Horst, to Texpa-Arbter Maschinenbaugesellschaft mbH. Device for straightening and cutting a textile strip. 4,493,234, Cl. 83-175.000.

Zimmerman, Morris: *See*—
Doherty, James B.; Zimmerman, Morris; and Ashe, Bonnie M., 4,493,839, Cl. 424-263.000.

Zimmerman, Ronald E.; Burck, Philip J.; Jones, C. David; and Thakkar, Arvind L., to Eli Lilly and Company. Contraceptive methods. 4,493,699, Cl. 604-55.000.

Zuerger, Manfred: *See*—
Vyvial, Rudolf; Taubitz, Christof; Schlemmer, Lothar; Bleckmann, Gerhard; Zuerger, Manfred; Krieger, Heinrich; and Thiele, Heino, 4,493,807, Cl. 264-101.000.

Zwiebel, Alan: *See*—
Kaufmann, F. William, III; and Zwiebel, Alan, 4,493,650, Cl. 434-178.000.

122923 Canada Limited: *See*—
Wimbush, Fred, 4,494,119, Cl. 343-457.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brunham, Robert D.: *See—*
Scifres, Donald R.; Streifer, William; and Brunham, Robert D., Re. 31,806, Cl. 372-50.000.

Conner, John M.: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

Dickerson, Charles W.: *See—*
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., Re. 31,804, Cl. 426-658.000.

Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., to Lummus Industries, Inc. Roller gin and feed system incorporating the same. Re. 31,802, Cl. 19-50.000.

General Electric Company: *See—*
Takekoshi, Tohru, Re. 31,805, Cl. 528-206.000.

Harmon, Bud G.: *See—*
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., Re. 31,804, Cl. 426-658.000.

Harmon, William A.: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, Willia.n C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

Hawkeye Chemical Company: *See—*
Moore, William P., Jr., Re. 31,801, Cl. 71-29.000.

Hawkins, James B.: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

Lauterjung, Friedrich G. Probe. Re. 31,800, Cl. 604-270.000.

Lummus Industries, Inc.: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

M. W. Carr & Co., Inc.: *See—*
Paskerian, Wayne H., Re. 31,799, Cl. 40-152.100.

Moore, William P., Jr., to Hawkeye Chemical Company. Urea-formaldehyde solution for foliar fertilization. Re. 31,801, Cl. 71-29.000.

Paskerian, Wayne H., to M. W. Carr & Co., Inc. Frame hanger. Re. 31,799, Cl. 40-152.100.

Pease, William C., III: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

Ralson Purina Company: *See—*
Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., Re. 31,804, Cl. 426-658.000.

Scifres, Donald R.; Streifer, William; and Brunham, Robert D., to Xerox Corporation. Monolithic multi-emitting laser device. Re. 31,806, Cl. 372-50.000.

Skoch, Leroy V.; Harmon, Bud G.; and Dickerson, Charles W., to Ralson Purina Company. Animal feed block containing ferrous sulfate and magnesium oxide. Re. 31,804, Cl. 426-658.000.

Streifer, William: *See—*
Scifres, Donald R.; Streifer, William; and Brunham, Robert D., Re. 31,806, Cl. 372-50.000.

Takekoshi, Tohru, to General Electric Company. Method for making polyimides. Re. 31,805, Cl. 528-206.000.

Tsou, Ivan H., to Wyandotte Paint Products Company. Method for cathodic electrodeposition of coating compositions containing diels-alder adducts. Re. 31,803, Cl. 204-181.00C.

Van Doorn, Donald W.: *See—*
Einglett, Robert R.; Conner, John M.; Harmon, William A.; Hawkins, James B.; Pease, William C., III; and Van Doorn, Donald W., Re. 31,802, Cl. 19-50.000.

Wyandotte Paint Products Company: *See—*
Tsou, Ivan H., Re. 31,803, Cl. 204-181.00C.

Xerox Corporation: *See—*
Scifres, Donald R.; Streifer, William; and Brunham, Robert D., Re. 31,806, Cl. 372-50.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allmanna Sverska Elektriska Aktiebolaget: *See—*
Larker, Hans, B1 3,732,068, Cl. 432-120.000.

Intel Corporation: *See—*
Pashley, Richard D., B1 4,052,229, Cl. 148-1.500.

Larker, Hans, to Allmanna Sverska Elektriska Aktiebolaget. Cylindrical elongated furnace for treating material at high temperature and under high pressure. B1 3,732,068, 1-15-85, Cl. 432-120.000.

Matsuda, Teruo; Wake, Shigeo; and Shiozaki, Tetsuya, to Sumitomo Chemical Company, Limited. Process for the preparation of azo compounds from amino compounds in the presence of a phase transfer catalyst. B1 4,272,435, 1-15-85, Cl. 260-192.000.

Pashley, Richard D., to Intel Corporation. Process for preparing a substrate for MOS devices of different thresholds. B1 4,052,229, 1-15-85, Cl. 148-1.500.

Shiozaki, Tetsuya: *See—*
Matsuda, Teruo; Wake, Shigeo; and Shiozaki, Tetsuya, B1 4,272,435, Cl. 260-192.000.

Sumitomo Chemical Company, Limited: *See—*
Matsuda, Teruo; Wake, Shigeo; and Shiozaki, Tetsuya, B1 4,272,435, Cl. 260-192.000.

Wake, Shigeo: *See—*
Matsuda, Teruo; Wake, Shigeo; and Shiozaki, Tetsuya, B1 4,272,435, Cl. 260-192.000.

LIST OF DESIGN PATENTEES

Abe, Shunji, to Yoshida Kogyo K. K. Pull tab for slide fastener. 277,140, 1-15-85, Cl. D2-415.000.

Aikey, William J.: *See—*
Doane, John C.; and Aikey, William J., 277,188, Cl. D14-107.000.

Allen, Brent R.: *See—*
Mower, Barry D.; and Allen, Brent R., 277,222, Cl. D21-244.000.

Allibert S.A.: *See—*
Boroch, Jersy, 277,146, Cl. D6-540.000.

Allsop, Inc.: *See—*
Clausen, Eivind; and Allsop, James D., 277,168, Cl. D8-394.000.

Allsop, James D.: *See—*
Clausen, Eivind; and Allsop, James D., 277,168, Cl. D8-394.000.

Altena Salotti s.r.l.: *See—*
Giudici, Gianbattista, 277,145, Cl. D6-381.000.

American Hospital Supply Corporation: *See—*
DeVroom, William A., 277,165, Cl. D8-72.000.

Antone, Howard J. Bottle opener. 277,160, 1-15-85, Cl. D8-40.000.

Appel, Mel; and Kress, George, to Appel, Mel. Toy dollhouse. 277,202, 1-15-85, Cl. D21-114.000.

Arcair Company: *See*—
Farmer, Ralph; and Johnson, David E., 277,191, Cl. D15-138.000.

Asahi, Tetsuma, to Silver Seiko Limited. Ribbon cartridge for typewriter. 277,193, 1-15-85, Cl. D18-12.000.

AT&T Technologies, Inc.: *See*—
Heim, Henry J.; and Ender, Alfred R., 277,181, Cl. D14-60.000.

Atari, Inc.: *See*—
Edson, Sydney, 277,155, Cl. D6-467.000.

Bachmann, G. Merle; Davis, Charles L.; and Morgan, Annis R., Jr., to Coca-Cola Company, The. Vending machine. 277,194, 1-15-85, Cl. D20-5.000.

Baylor, Charles R.; and Cannon, Curtis. Utility cushion. 277,158, 1-15-85, Cl. D6-596.000.

Bevilacqua, Ernest M., to Oki Electric Overseas Corporation. Control console for a mobile telephone with handset. 277,164, 1-15-85, Cl. D8-53.000.

Blesch, Thomas C., to General Aluminum Products, Inc. Heater enclosure. 277,228, 1-15-85, Cl. D23-138.200.

Boroch, Jersy, to Allibert S.A. Wall-mounted soap dish. 277,146, 1-15-85, Cl. D6-540.000.

Brun, Serge, to Calor S.A. Face depilating apparatus. 277,233, 1-15-85, Cl. D24-26.000.

Bulgari, Marina, to Zoldia Anstalt. Bracelet or the like. 277,171, 1-15-85, Cl. D11-3.000.

Burnett, Kevin: *See*—
Deeley, Frank; Deeley, Lawrence; and Burnett, Kevin, 277,172, Cl. D11-158.000.

Cagle, Bunyan B. Fireplace cross-circulating air heater. 277,225, 1-15-85, Cl. D23-95.000.

Call, Daniel D., to Oy Fiskars AB. Dual knife sharpener with dual handle. 277,166, 1-15-85, Cl. D8-93.000.

Calor S.A.: *See*—
Brun, Serge, 277,233, Cl. D24-26.000.

Cannon, Curtis: *See*—
Baylor, Charles R.; and Cannon, Curtis, 277,158, Cl. D6-596.000.

Caplygin, Dimitri, to Girlock Limited. Disc brake pad unit. 277,175, 1-15-85, Cl. D12-180.000.

Carson, David L., to Lucasfilm, Ltd. Toy figure. 277,206, 1-15-85, Cl. D21-148.000.

Cascarano, Anthony J.: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 277,182, Cl. D14-84.000.

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87	4,493,726
92	4,493,728
94	4,493,729
	4,493,730
088	4,493,727
118	4,493,731

CLASS 72

319	4,493,200
349	4,493,201
353	4,493,202
369	4,493,203
389	4,493,204
391	4,493,205

CLASS 73

7	4,493,206
40.7	4,493,207
117.3	4,493,208
118	4,493,209
121	4,493,210
147	4,493,211
517 R	4,493,212
664	4,493,213
779	4,493,214
861.18	4,493,215
861.25	4,493,216
861.27	4,493,217
862	4,493,218
862.05	4,493,219
862.66	4,493,220

CLASS 74

216.3	4,493,222
371	4,493,223
473 R	4,493,224
551.3	4,493,225
598	4,493,226
711	4,493,227
858	4,493,228

CLASS 75

24	4,493,732
126 B	4,493,733

CLASS 76

107 A	4,493,229

CLASS 81

3 R	4,493,230

CLASS 82

4 A	4,493,231
4 C	4,493,232

CLASS 83

71	4,493,233
175	4,493,234
303	4,493,235
440.1	4,493,236

CLASS 84

1.26	4,493,237
282	4,493,238

CLASS 89

1.13	4,493,239
1.14	4,493,240
	4,493,241

CLASS 91

1	4,493,242
369 B	4,493,243
420	4,493,244

CLASS 92

2	4,493,245
13.8	4,493,246

CLASS 98

1	4,493,247
52	4,493,248

CLASS 99

275	4,493,249
456	4,493,250

CLASS 100

53	4,493,251

CLASS 101

71	4,493,252
93.03	4,493,253
123	4,493,254
183	4,493,255
216	4,493,256
349	4,493,257
415.1	4,493,258

CLASS 102

218	4,493,259
307	4,493,260
331	4,493,261
363	4,493,262
483	4,493,263
491	4,493,264

CLASS 104

269	4,493,265

CLASS 105

255	4,493,266

CLASS 106

309	4,493,734

CLASS 108

50	4,493,267

CLASS 109

52	4,493,268

CLASS 110

106	4,493,269
188	4,493,270
262	4,493,271

CLASS 111

59	4,493,272
86	4,493,273
88	4,493,274

CLASS 112

105	4,493,275
121.12	4,493,276
153	4,493,277
184	4,493,278
220	4,493,279
260	4,493,280

CLASS 114

20 R	4,493,281
230	4,493,282
263	4,493,283
267	4,493,284
363	4,493,285

CLASS 118

677	4,493,286
719	4,493,287

CLASS 119

1	4,493,288
21	4,493,289
51 R	4,493,290

CLASS 122

7 R	4,493,291

CLASS 123

41.12	4,493,293
41.2	4,493,292
41.33	4,493,294
41.86	4,493,295
55 AA	4,493,296
143 B	4,493,297
145 A	4,493,298
185 S	4,493,299
325	4,493,300
339	4,493,301
357	4,493,302
	4,493,303
479	4,493,304
490	4,493,305
620	4,493,306
630	4,493,307

CLASS 126

41 R	4,493,308
91 A	4,493,309
92 C	4,493,310
285 A	4,493,311
299 D	4,493,312
438	4,493,313

CLASS 128

1 D	4,493,314
60	4,493,315
80 C	4,493,316
92 D	4,493,317
200.19	4,493,318
303 A	4,493,319
303.15	4,493,320
305	4,493,321
334 R	4,493,322
340	4,493,323
360	4,493,324
419 PG	4,493,325
680	4,493,326
731	4,493,327
782	4,493,328
786	4,493,329

CLASS 130

31 R	4,493,330

CLASS 131

336	4,493,331

CLASS 132

46 A	4,493,332

CLASS 134

25.1	4,493,735
76	4,493,333

CLASS 135

75	4,493,334

CLASS 136

212	4,493,939
248	4,493,940
255	4,493,941
259	4,493,942

CLASS 137

116.3	4,493,335
312	4,493,336
449	4,493,337
454.2	4,493,338
510	4,493,339
594	4,493,340
597	4,493,341
601	4,493,342
625.17	4,493,343

CLASS 138

89	4,493,344
178	4,493,345

CLASS 139

76	4,493,346
449	4,493,347

CLASS 141

1	4,493,348
59	4,493,349
65	4,493,350

CLASS 144

3 R	4,493,351
162 R	4,493,352

CLASS 145

46	4,493,353

CLASS 148

1.5	B1 4,052,229
2	4,493,736
11.5 R	4,493,737
24	4,493,738
111	4,493,739
187	4,493,740

CLASS 149

19.4	4,493,741

CLASS 152

242	4,493,354
329	4,493,355

CLASS 156

64	4,493,747
79	4,493,748
91	4,493,742
187	4,493,749
555	4,493,743
568	4,493,744
626	4,493,745
644	4,493,746

CLASS 159

48.1	4,493,750

CLASS 160

133	4,493,356
174	4,493,357
349 R	4,493,358

CLASS 162

157.2	4,493,751

CLASS 164

58.1	4,493,359
286	4,493,360
443	4,493,361
457	4,493,362
476	4,493,363

CLASS 165

1	4,493,364
10 A	4,493,365
54	4,493,366
72	4,493,367
159	4,493,368

CLASS 166

261	4,493,369
273	4,493,370
274	4,493,371
285	4,493,372
321	4,493,373
382	4,493,374

CLASS 172

1	4,493,375

CLASS 173

139	4,493,376
170	4,493,377

CLASS 174

25 C	4,493,943
50.64	4,493,944
68 C	4,493,945
88 C	4,493,946
152 GM	4,493,378

CLASS 175

57	4,493,379
61	4,493,380
107	4,493,381
206	4,493,382
234	4,493,383

CLASS 177

25	4,493,384

CLASS 179

2 A	4,493,947
	4,493,948
18 BC	4,493,949
81 B	4,493,950
175.3 F	4,493,951

CLASS 180

6.2	4,493,385
89.15	4,493,386
248	4,493,387
258	4,493,388

CLASS 181

152	4,493,389
204	4,493,390

CLASS 182

6	4,493,391
27	4,493,392
129	4,493,393
179	4,493,394
187	4,493,395
238	4,493,396

CLASS 187

9 E	4,493,397
29 R	4,493,398
	4,493,399

CLASS 188

77 W	4,493,400
199	4,493,401

CLASS 192

4 A	4,493,403
	4,493,404
18 R	4,493,405
58 B	4,493,406
84 C	4,493,407
106.2	4,493,408
115	4,493,409
326	4,493,402

CLASS 194

1 G	4,493,410
100 A	4,493,411

CLASS 198

434	4,493,412
708	4,493,413
800	4,493,414

CLASS 200

5 A	4,493,952
6 B	4,493,953
11 R	4,493,954
38 R	4,493,955
61.47	4,493,956
81 R	4,493,957
314	4,493,958
340	4,493,959

CLASS 203

71	4,493,752

CLASS 204

9	4,493,753

47 4,493,754
73 R 4,493,755
141.5 4,493,756
181 C Re.31,803
206 4,493,757
224 R 4,493,758
252 4,493,759
278 4,493,760

CLASS 206

175 4,493,415
315.11 4,493,416
387 4,493,417
454 4,493,418
554 4,493,419

CLASS 208

10 4,493,761
11 R 4,493,762
4,493,763
138 4,493,764
309 4,493,765

CLASS 209

362 4,493,766
587 4,493,420

CLASS 210

236 4,493,767
360.2 4,493,768
4,493,769
603 4,493,770
700 4,493,771
799 4,493,772

CLASS 211

13 4,493,421
26 4,493,422
123 4,493,423
149 4,493,424
189 4,493,425

CLASS 212

261 4,493,426

CLASS 215

230 4,493,427

CLASS 219

10.55 B 4,493,960
64 4,493,962
69 R 4,493,961
76.1 4,493,963
78.02 4,493,964
85 D 4,493,986
109 4,493,965
121 EC 4,493,966
121 LC 4,493,967
124.34 4,493,968
130.4 4,493,969
137.41 4,493,970
137.52 4,493,971
230 4,493,972
286 4,493,973
341 4,493,974
370 4,493,975
398 4,493,976
411 4,493,977
438 4,493,978
446 4,493,979
450 4,493,980
4,493,981
469 4,493,982
494 4,493,983
501 4,493,984
535 4,493,985

CLASS 220

1.5 4,493,428
211 4,493,429
224 4,493,430
269 4,493,431
270 4,493,432
306 4,493,433

CLASS 222

3 4,493,434
52 4,493,435
80 4,493,436
82 4,493,437
83 4,493,438
94 4,493,439
109 4,493,440
129.1 4,493,441
241 4,493,442
400.8 4,493,443
402.22 4,493,444

CLASS 223

68 4,493,445

CLASS 225

21 4,493,446

CLASS 226

150 4,493,447

CLASS 227

119 4,493,448

CLASS 228

7 4,493,449
49 R 4,493,450
119 4,493,451
158 4,493,452

CLASS 229

17 B 4,493,453

CLASS 232

15 4,493,454

CLASS 235

1 D 4,493,987
96 4,493,988
464 4,493,989

CLASS 236

34.5 4,493,455
49 4,493,456

CLASS 239

25 4,493,457
230 4,493,458

CLASS 241

152 A 4,493,459

CLASS 242

58.6 4,493,460
96 4,493,461
118.61 4,493,462
158 F 4,493,463
170 4,493,464

CLASS 244

17.13 4,493,465
152 4,493,466

CLASS 248

56 4,493,467
62 4,493,468
406.1 4,493,469
503.1 4,493,470
580 4,493,471

CLASS 249

57 4,493,472

CLASS 250

201 4,493,990
203 R 4,493,991
221 4,493,992
222.1 4,493,993
223 R 4,493,994
227 4,493,995
4,493,996
231 SE 4,493,997
252.1 4,493,998
260 4,493,999
311 4,494,000
358.1 4,494,001
377 4,494,002
474.1 4,494,003
492.2 4,494,004
4,494,005

CLASS 251

63.4 4,493,473
129 4,493,474
149.1 4,493,475
176 4,493,476

CLASS 252

8.55 C 4,493,775
8.55 D 4,493,774
8.8 4,493,773
25 4,493,776
49.3 4,493,777
62.54 4,493,778
62.59 4,493,779
73 4,493,780
88 4,493,781
95 4,493,782
174.23 4,493,783
182 4,493,784
299.1 4,493,785
368 4,493,786
511 4,493,787
4,493,788
514 4,493,789
522 R 4,493,790
4,493,791
627 4,493,792

CLASS 254

15 4,493,477
126 4,493,478
274 4,493,479

CLASS 256

10 4,493,480

CLASS 260

112 R 4,493,793
112.5 E 4,493,795
112.5 R 4,493,794
4,493,796
192 B1 4,272,435
465 D 4,493,800
465 H 4,493,799
465.6 4,493,801
507 R 4,493,802
968 4,493,803

CLASS 261

44 C 4,493,804

CLASS 264

25 4,493,805
28 4,493,806
101 4,493,807
108 4,493,808

CLASS 267

64.27 4,493,481

CLASS 270

12 4,493,482

CLASS 271

186 4,493,483
220 4,493,484

CLASS 272

126 4,493,485

CLASS 273

25 4,493,486
153 S 4,493,487

CLASS 280

42 4,493,488
238 4,493,489
276 4,493,490
402 4,493,491
651 4,493,492
661 4,493,493
821 4,493,494

CLASS 281

45 4,493,495

CLASS 282

11.5 A 4,493,496

CLASS 285

13 4,493,497

CLASS 289

2 4,493,498

CLASS 290

4 4,494,006
44 4,494,007
4,494,008
55 4,494,009

CLASS 292

158 4,493,499
262 4,493,500
263 4,493,501

CLASS 293

128 4,493,502

CLASS 294

19 A 4,493,503
146 4,493,504

CLASS 296

63 4,493,505
209 4,493,506
216 4,493,507

CLASS 303

6 C 4,493,508
13 4,493,509
28 4,493,510
36 4,493,511

CLASS 307

33 4,494,010
106 4,494,011
132 E 4,494,012
241 4,494,013
254 4,494,014
268 4,494,015
450 4,494,016
463 4,494,017
482 4,494,018
491 4,494,019
530 4,494,020
591 4,494,021

CLASS 308

2 R 4,493,512

CLASS 310

14 4,494,022
21 4,494,023
75 A 4,494,024
80 4,494,025
89 4,494,026
4,494,027
156 4,494,028
239 4,494,029
256 4,494,030
313 B 4,494,031
324 4,494,032
352 4,494,033

CLASS 313

341 4,494,034
346 R 4,494,035
420 4,494,036
584 4,494,037
587 4,494,038

CLASS 315

4 4,494,039
5.41 4,494,040
49 4,494,041
56 4,494,042
111.41 4,494,043
151 4,494,044
247 4,494,045
260 4,494,046
368 4,494,047
408 4,494,048

CLASS 318

138 4,494,049
158 4,494,050
254 4,494,051
4,494,052
4,494,053
4,494,054
4,494,055
269 4,494,056
317 4,494,057
372 4,494,058
443 4,494,059
568 4,494,060
628 4,494,061

CLASS 320

40 4,494,062
56 4,494,063

CLASS 323

277 4,494,064

CLASS 324

61 R 4,494,065
73 R 4,494,066
79 D 4,494,067
126 4,494,068
158 R 4,494,069
208 4,494,070
338 4,494,071
347 4,494,072

CLASS 328

14 4,494,073

CLASS 330

109 4,494,074
254 4,494,075
284 4,494,076
295 4,494,077
297 4,494,078

CLASS 331

1 A 4,494,079
8 4,494,080
36 C 4,494,081
94.1 4,494,085
96 4,494,086
107 DP 4,494,087
111 4,494,088

CLASS 332

14 4,494,089
16 T 4,494,090

CLASS 333

28 R 4,494,082
33 4,494,083
81 R 4,494,084
151 4,494,091
182 4,494,092
232 4,494,093
239 4,494,094

CLASS 334

85 4,494,095

CLASS 335

170 4,494,096
213 4,494,097
230 4,494,098
299 4,494,099

CLASS 336

200 4,494,100
210 4,494,101
212 4,494,102

CLASS 337

282 4,494,103
403 4,494,104

CLASS 338

114 4,494,105

CLASS 339

14 L 4,493,515
21 R 4,493,516
42 4,493,517
45 M 4,493,518
75 M 4,493,519
91 P 4,493,520
92 M 4,493,521
94 C 4,493,522
105 4,493,523
125 R 4,493,524
143 R 4,493,525
183 4,493,526
258 R 4,493,527

CLASS 340

58 4,494,106
347 DA 4,494,107
347 DD 4,494,108
365 L 4,494,109
365 R 4,494,110
533 4,494,111
606 4,494,112
825.31 4,494,114
825.5 4,494,113
825.65 4,494,115
995 4,494,116

CLASS 343

365 4,494,117
424 4,494,118
457 4,494,119
702 4,494,120
708 4,494,121
722 4,494,122
900 4,494,123

CLASS 346

1.1 4,494,124
74.5 4,494,125
76 PH 4,494,126
82 4,494,127
140 R 4,494,128
154 4,494,129
160 4,494,130

CLASS 350

96.15 4,493,528
96.20 4,493,529
96.34 4,493,530
336 4,493,531
349 4,493,532
418 4,493,533
429 4,493,534
452 4,493,535
462 4,493,536
469 4,493,537

CLASS 351

57 4,493,538
205 4,493,539

CLASS 353

122 4,493,540

CLASS 354

5 4,493,541
82 4,493,542
109 4,493,543
246 4,493,544
277 4,493,545
324 4,493,546
424 4,493,547

CLASS 355

3 FU 4,493,548
3 R 4,493,549
10 4,493,550
22 4,493,551
75 4,493,552

CLASS 356

43 4,493,553
241 4,493,554
358 4,493,555

CLASS 357

5 4,494,131
30 4,494,132
4,494,133
43 4,494,134
59 4,494,135
67 4,494,136

CLASS 358

27 4,494,137
86 4,494,138
101 4,494,139
105 4,494,140
111 4,494,141
118 4,494,142
122 4,494,143
133 4,494,144
163 4,494,145
184 4,494,146
209 4,494,147
226 4,494,148
257 4,494,149
260 4,494,150
261 4,494,151
293 4,494,152
324 4,494,153
342 4,494,154

CLASS 360

47 4,494,155
48 4,494,156
4,494,157
69 4,494,158
78 4,494,159
129 4,494,160
132 4,494,161

CLASS 361

29 4,494,162
56 4,494,163
101 4,494,164
117 4,494,165
214 4,494,166
270 4,494,167
273 4,494,168
306 4,494,169
4,494,170
386 4,494,171
400 4,494,172
429 4,494,173
433 4,494,174

CLASS 362

150 4,494,175
297 4,494,176
402 4,494,177

CLASS 363

21 4,494,178
35 4,494,179
37 4,494,180
63 4,494,181
4,494,182

CLASS 364

154 4,494,183
178 4,494,184
200 4,494,185
4,494,186
4,494,187
4,494,188
4,494,189
4,494,190
4,494,191
4,494,192
4,494,193
4,494,194
4,494,195
4,494,196
412 4,494,197
423 4,494,198
426 4,494,199
449 4,494,200
4,494,201
462 4,494,202
470 4,494,203
4,494,204
472 4,494,205
474 4,494,206
494 4,494,207
4,494,208
502 4,494,209
567 4,494,210
571 4,494,211
4,494,212
604 4,494,213
724 4,494,214
900 4,494,215

CLASS 365

36 4,494,216
53 4,494,217
104 4,494,218
189 4,494,219
200 4,494,220
203 4,494,221
222 4,494,222
233 4,494,223

CLASS 366

114 4,493,556
300 4,493,557
341 4,493,558

CLASS 367

2 4,494,224

CLASS 368

74 4,493,559
88 4,493,560
281 4,493,561
294 4,493,562

CLASS 369

44 4,494,225

CLASSIFICATION OF PATENTS

45 4,494,226
147 4,494,227

CLASS 370

18 4,494,228
58 4,494,229
60 4,494,230
4,494,231
80 4,494,232
86 4,494,233

CLASS 371

38 4,494,234

CLASS 372

23 4,494,235
25 4,494,236
45 4,494,237
50 Re.31,806

CLASS 374

121 4,493,563
179 4,493,564
185 4,493,565

CLASS 375

1 4,494,238
39 4,494,239
75 4,494,240
76 4,494,241
118 4,494,242

CLASS 376

171 4,493,809
254 4,493,810
4,493,811
352 4,493,812
409 4,493,813
428 4,493,814

CLASS 377

48 4,494,243

CLASS 384

533 4,493,513
613 4,493,514

CLASS 400

59 4,493,566
124 4,493,567
4,493,568
144.2 4,493,569
4,493,570
4,493,571
196.1 4,493,572
647.1 4,493,573

CLASS 401

132 4,493,574
195 4,493,575
283 4,493,576

CLASS 403

41 4,493,577
49 4,493,578
237 4,493,579
252 4,493,580
323 4,493,581
382 4,493,582
402 4,493,583

CLASS 404

74 4,493,584
102 4,493,585

CLASS 405

17 4,493,586
114 4,493,587
119 4,493,588
166 4,493,589
170 4,493,590
198 4,493,591
225 4,493,592

CLASS 406

146 4,493,593

CLASS 407

41 4,493,594

CLASS 408

46 4,493,595
233 4,493,596

CLASS 411

198 4,493,597

CLASS 414

1 4,493,598
120 4,493,599
208 4,493,600
491 4,493,601
541 4,493,602
4,493,603
622 4,493,604
726 4,493,605
787 4,493,606

CLASS 415

11 4,493,607
4,493,608
20 4,493,609
104 4,493,610
199.1 4,493,611

CLASS 416

20 R 4,493,612

CLASS 417

15 4,493,613
22 4,493,614
48 4,493,615
53 4,493,616
214 4,493,617
234 4,493,618
307 4,493,619
366 4,493,620
462 4,493,621

CLASS 418

57 4,493,622
94 4,493,623
98 4,493,624
126 4,493,625
260 4,493,626

CLASS 422

101 4,493,815
143 4,493,816

CLASS 423

62 4,493,817
240 4,493,818
277 4,493,819
310 4,493,820

CLASS 424

3 4,493,821
15 4,493,822
70 4,493,823
4,493,824
88 4,493,825
118 4,493,826
166 4,493,827
177 4,493,828
4,493,829
4,493,830
180 4,493,831
199 4,493,832
246 4,493,833
4,493,834
4,493,835
248.4 4,493,836
253 4,493,837
258 4,493,838
263 4,493,839
269 4,493,840
273 R 4,493,841
4,493,842
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